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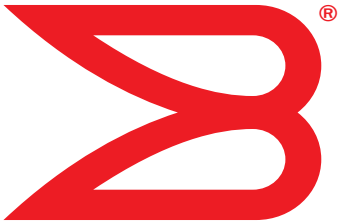
31 May 2012



Brocade FCX Series

Hardware Installation Guide

Supporting Brocade FastIron R07.4.00

BROCADE

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Contents

About This Document

Supported hardware and software vii
Document conventions vii
Text formatting viii
Command syntax conventions viii
Notes, cautions, and danger notices viii
Notice to the reader ix
Related publications ix
Getting technical help or reporting errors ix
Document feedback x

Chapter 1 Product Overview

Hardware features 1
Control features 5
Power supplies 15

Chapter 2 Installing the FastIron CX Switch

Unpacking the device 17
Package contents 17
General requirements 17
Installation tasks 18
Installation precautions 18
General precautions 18
Lifting precautions 19
Power precautions 19
Preparing the installation site 20
Cabling infrastructure 20
Installation location 20
Installing the device 20
Desktop installation 21
Rack mount installation 21
Connecting devices in a stack 23
Powering on the system 26
Attaching a PC or terminal 27
Wiring map for serial cable 28
Installing and replacing a power supply unit 28

Installing or replacing fan trays on Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE,. 29
and FCX648-HPOE devices. 29
Installing or replacing fan trays on Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E,. 30
and Brocade FCX 648-I devices 30
Installing an optional module on Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, or FCX648-HPOE devices 31
Installing an optional module in Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E,. 32
and Brocade FCX 648-I devices 32

Chapter 3 Checking Network Devices and Testing Connectivity

Assigning permanent passwords 35
Setting passwords 36
Recovering from a lost password 36
Configuring IP addresses 37
Devices running Layer 2 software 37
Devices running Layer 3 software 38
Connecting network devices 41
Connectors. 41
Cable specifications. 41
Connecting to Ethernet or fast Ethernet hubs 41
Connecting to workstations, servers, or routers 42
Connecting a network device to a fiber port 42
Testing connectivity. 45
Pinging an IP address 45
Observing LEDs 45
Tracing a route 47
Troubleshooting network connections. 47
Using Virtual Cable Testing to diagnose a cable 48
Digital optical monitoring 49

Chapter 4 Managing the FastIron CX Hardware

Managing temperature settings. 51
Using the temperature sensor 51
Removing MAC address entries 55
Displaying FastIron CX CPU usage 55
Hardware maintenance schedule 56
Replacing a copper or fiber optic module 56
Removing a copper or fiber optic module 56
Cabling a fiber optic module 57
Cleaning the fiber optic connectors 57

Chapter 5 Hardware Specifications

Hardware specifications 59
Physical dimensions and weight 59
Environmental considerations 59
Cooling system and fans 60
Pinouts and signalling 63
Cable specifications 64
Power cords 65
AC power supply specifications 65

Chapter 6 Troubleshooting

Diagnosing switch indicators 67
Power and cooling problems 67
Installation 67
In-band access 68

Appendix A Regulatory Statements

USA (FCC CFR 47 Part 15 Warning) 69
Industry Canada statement 69
Europe and Australia (CISPR 22 Class A Warning) 69
Japan (VCCI) 69
Japan power cord 70
Korea 70
China 71
BSMI statement (Taiwan) 72
Russia 72
Regulatory compliance 72

Appendix B Cautions and Danger Notices

Cautions 73
Danger notices 75

About This Document

In this chapter

- Supported hardware and software. vii
- Document conventions vii
- Notice to the reader ix
- Related publications ix
- Getting technical help or reporting errors ix

Supported hardware and software

This guide describes the FCX series devices running software release 07.4.00.

The following hardware platforms are supported by the release of this guide:

- Brocade FCX 624S
- Brocade FCX 648S
- Brocade FCX 624S-F
- Brocade FCX 624S-HPOE
- Brocade FCX 648S-HPOE
- Brocade FCX 624-E
- Brocade FCX 624-I
- Brocade FCX 648-E
- Brocade FCX 648-I

Document conventions

This section describes text formatting conventions and important notice formats used in this document.

Text formatting

The following narrative-text formatting conventions are used in this guide.

bold text	Identifies command names
	Identifies the names of user-manipulated GUI elements
	Identifies keywords
	Identifies text to enter at the GUI or CLI
italic text	Provides emphasis
	Identifies variables
	Identifies document titles
`code` text	Identifies CLI output

For readability, command names in the narrative portions of this guide are presented in bold: for example, **show version**. In actual examples, command lettercase is often all lowercase. Otherwise, this manual specifically notes those cases in which a command is case sensitive.

Command syntax conventions

The following conventions apply to the command syntax in this guide.

command and parameters	Commands and parameters are printed in bold.
[ ]	Optional parameter.
variable	Variables are printed in italics enclosed in angled brackets < >.
...	Repeat the previous element, for example “member[;member...]”
|	Choose from one of the parameters.

Notes, cautions, and danger notices

The following note, cautions, and danger statements are used in this manual. They are listed here in order of increasing severity of potential hazards.

NOTE
A note provides a tip, guidance or advice, emphasizes important information, or provides a reference to related information.

CAUTION

A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

DANGER

A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

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Royal Philips Electronics Inc.	Philips

Related publications

The following Brocade documents supplement the information in this guide:

- *FastIron Configuration Guide*.
- *IronWare MIB Reference Guide*

NOTE
For the latest edition of these documents, which contain the most up-to-date information, go to *http://www.brocade.com/ethernetproducts*.

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Provide the title and version number of the document and as much detail as possible about your comment, including the topic heading and page number and your suggestions for improvement.

Chapter

1 Product Overview

Hardware features

The following hardware platforms are supported by this release of this guide:

- The Brocade FCX 624S stackable switch has twenty 10/100/1000 Mbps ports plus four Combo ports, which include four 10/100/1000 Mbps RJ45 ports and four 100/1000 Mbps SFP ports. The switch has two management interfaces, a DB9 serial port (**Console**) on the front panel and an RJ45 port (**Out-of-band Management Interface**) on the rear panel. Two rear-panel power supply receptacles allow for up to two power supply units. Two dedicated 16 GbE CX4 ports on the rear panel allow stacking for up to eight units. The front panel also has a module slot for an optional two-port 10 Gbps XFP module.
- The Brocade FCX 648S stackable switch has forty four 10/100/1000 Mbps RJ45 ports plus four Combo ports, which include four 10/100/1000 Mbps RJ45 ports and four 100/1000 Mbps SFP ports. The switch has two management interfaces, a DB9 serial port (**Console**) on the front panel and an RJ45 port (**Out-of-band Management Interface**) on the rear panel. Two rear-panel power supply receptacles allow for up to two power supply units. Two dedicated 16 Gbps Ethernet CX4 ports on the rear panel allow stacking for up to eight units. The front panel also has a module slot for an optional two-port 10 Gbps Ethernet XFP module.
- The Brocade FCX 624S-F stackable switch has two management interfaces, a DB9 serial port (**Console**) on the front panel and an RJ45 port (**Out-of-band Management Interface**) on the rear panel. Two rear-panel power supply receptacles allow for up to two power supply units. Two dedicated 16 Gbps Ethernet CX4 ports on the rear panel allow stacking for up to eight units. The front panel also has a module slot for an optional two-port 10 Gbps Ethernet XFP module.
- The Brocade FCX 624S-HPOE stackable switch has twenty 100/1000 Mbps ports plus four Combo ports, which include four 10/100/1000 Mbps RJ45 ports and four 100/1000 Mbps SFP ports. The switch has two management interfaces, a DB9 serial port (**Console**) on the front panel and an RJ45 port (**Out-of-band Management Interface**) on the rear panel. Two rear-panel power supply receptacles allow for up to two power supply units. Two dedicated 16 Gbps Ethernet CX4 ports on the rear panel allow stacking for up to eight units. The front panel also has a module slot for an optional two-port 10 Gbps Ethernet XFP module.
- The Brocade FCX 648S-HPOE has is a stackable switch with forty four 10/100/1000 Mbps ports plus four Combo ports, which include four 10/100/1000 Mbps RJ45 ports and four 100/1000 Mbps SFP ports. The switch has two management interfaces, a DB9 serial port (**Console**) on the front panel and an RJ45 port (**Out-of-band Management Interface**) on the rear panel. Two rear-panel power supply receptacles allow for up to two power supply units. Two dedicated 16 Gbps Ethernet CX4 ports on the rear panel allow stacking for up to eight units. The front panel also has a module slot for an optional two-port 10 Gbps Ethernet XFP module.

- The Brocade FCX 624-E switch has twenty four 10/100/1000 Mbps ports plus four Combo 1 Gbps ports. The device has two management interfaces on the front panel, a DB9 serial port (**Console**) and an RJ45 port (**Out-of-band Management Interface**). The front panel has a slot for an optional four-port 1GbE SFP module (works as Combo port) or four-port 10 Gbps SFP+ module. On the rear panel a removable fan tray provides a cooling airflow from the front to the rear of the device. Two rear-panel power supply receptacles accommodate up to two power supply units that also support a front-to-rear cooling airflow.
- The Brocade FCX 624-I switch has twenty four 10/100/1000 Mbps ports plus four Combo 1 Gbps ports. The device has two management interfaces on the front panel, a serial port (**Console**) and an RJ45 port (**Out-of-band Management Interface**). The front panel has a slot for an optional four-port 1GbE SFP module (works as Combo port) or four-port 10 Gbps SFP+ module. On the rear panel a removable fan tray provides a cooling airflow from the rear to the front of the device. Two rear-panel power supply receptacles accommodate up to two power supply units that also support a rear-to-front cooling airflow.
- The Brocade FCX 648-E switch has forty four 10/100/1000 Mbps ports plus four Combo 1 Gbps ports. The device has two management interfaces on the front panel, a serial port (**Console**) and an RJ45 port (**Out-of-band Management Interface**). The front panel has a slot for an optional four-port 1GbE SFP module (works as Combo port) or four-port 10 Gbps SFP+ module. On the rear panel a removable fan tray provides a cooling airflow from the front to the rear of the device. Two rear-panel power supply receptacles accommodate up to two power supply units that also support a front-to-rear cooling airflow..
- The Brocade FCX 648-I switch has forty four 10/100/1000 Mbps ports plus four Combo 1 Gbps ports. The device has two management interfaces on the front panel, a serial port (**Console**) and an RJ45 port (**Out-of-band Management Interface**). The front panel has a slot for an optional four-port 1GbE SFP module, (works as Combo port) or four-port 10 Gbps SFP+ module. On the rear panel a removable fan tray provides a cooling airflow from the rear to the front of the device. Two rear-panel power supply receptacles accommodate up to two power supply units that also support a rear-to-front cooling airflow.

NOTE
All FCX models support Layer 2 and Enterprise Layer 3 protocols (RIP, OSPF, PIM). FCX models can be ordered from the factory as -ADV (Advanded Layer 3) models, which adds support for the Layer 3 BGP routing protocol.

The following sections describe the physical characteristics of the FastIron CX models. For more details about physical dimensions, power supply specifications, and pinouts, refer to "Hardware Specifications" on page 59.

The following figures show the front panels of the FastIron CX models. For more information about Combo ports, see "Combination ports" on page 6. For more information about control features in general, see "Control features" on page 5.

FIGURE 1 Brocade FCX 624S front panel

FIGURE 2 Brocade FCX 648S front panel

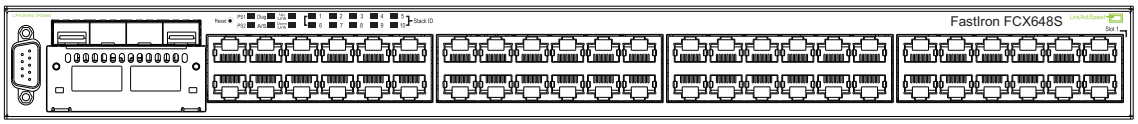


FIGURE 3 Brocade FCX 624S-F front panel

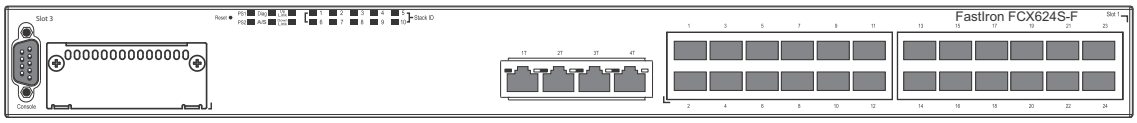


FIGURE 4 Brocade FCX 624S-HPOE front panel

FIGURE 5 Brocade FCX 648S-HPOE front panel

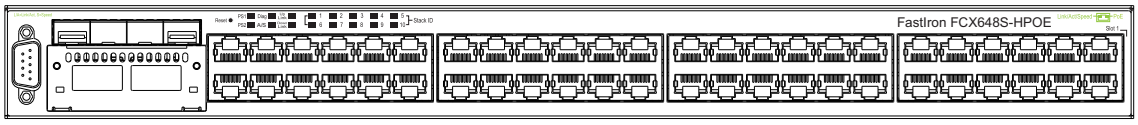


FIGURE 6 Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, Brocade FCX 624S-HPOE, Brocade FCX 648S-HPOE rear panel

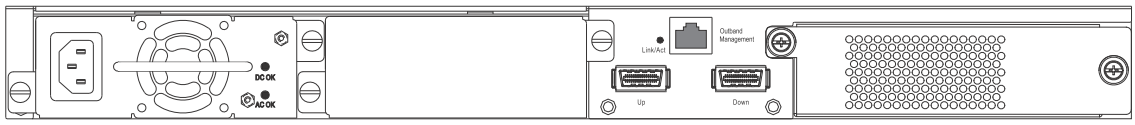


FIGURE 7 Brocade FCX 624-E front panel

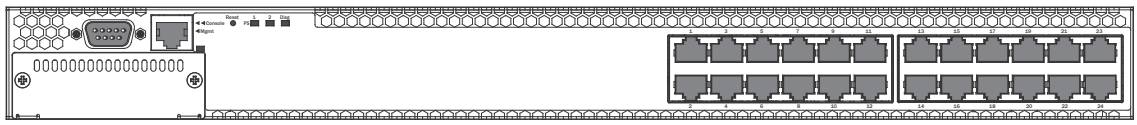


FIGURE 8 Brocade FCX 624-I front panel

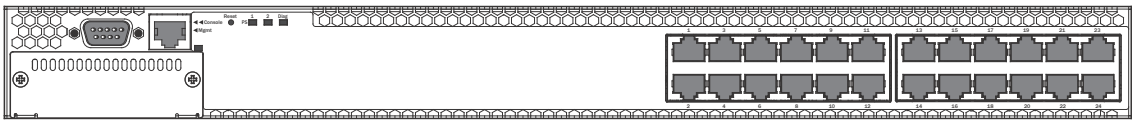


FIGURE 9 Brocade FCX 648-E front panel

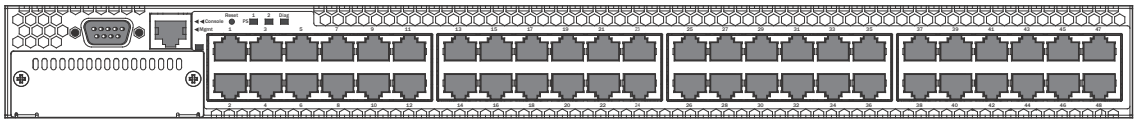


FIGURE 10 Brocade FCX 648-I front panel

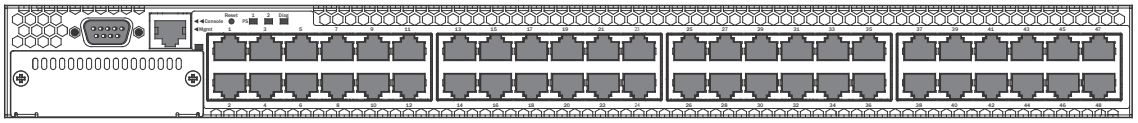
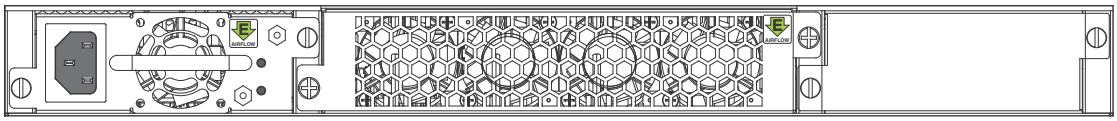


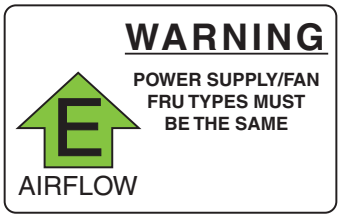
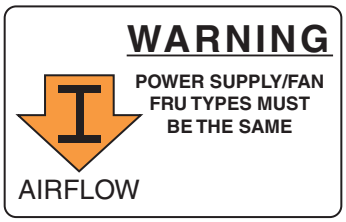
FIGURE 11 Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, Brocade FCX 648-I rear panels



CAUTION

For the Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, and Brocade FCX 648-I devices, be sure that the airflow direction of the power supply unit matches that of the installed resiliant quad-fan fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an “E”, or an orange arrow with an “I” as shown in Table 1.

TABLE 1 Power supply and fan tray labels for Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, and Brocade FCX 648-I devices

Device	Label on required power supply	Label on required fan tray
Brocade FCX 624-E and Brocade FCX 648-E		
Brocade FCX 624-I and Brocade FCX 648-I		

Control features

Each device front panel includes the following control features:

- Serial management interface (the DB9 port labeled **Console**)
- Out-of-band RJ45 management Interface

Serial management interface (DB9 Console port)

The serial management interface allows you to configure and manage the device using a third-party terminal emulation application on a directly-connected PC. A straight-through EIA or TIA DB9 serial cable (M or F) ships with the device. The serial management interface (the DB9 **Console** port) is located in the left corner of the front panel.

Out-of-band RJ45 management interface

The out-of-band RJ45 management interface enables you to configure and manage the device using a third-party terminal emulation application on a directly-connected PC.

Network interfaces for Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, FCX648-HPOE

FastIron CX devices contain the following interfaces:

- 10/100/1000 Mbps ports with RJ45 copper connectors
- 100/1000 Mbps ports with mini-GBIC slots for SFP MSA-compliant fiber transceivers
- Optional 2-port 10Gbps Ethernet XFP module
- CX4 stacking ports

Network interfaces for Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, Brocade FCX 648-I

FastIron CX devices contain the following interfaces:

- 10/100/1000 ports with RJ45 copper connectors
- 100/1000 ports with mini-GBIC slots for MSA-compliant SFP transceivers
- Optional 4-port 1Gbps Ethernet SFP module
- Optional 4-port 10Gbps Ethernet SFP+ module

FastIron CX 10/100/1000 BASE-T ports

All FastIron CX devices except for the fiber models contain 24 or 48 RJ45 ports that operate at 10 Mbps or 100 Mbps, half or full duplex, or at 1000 Mbps, full duplex. FastIron CX fiber models contain 24 or 48 SFP ports. Because all ports support automatic MDI or MDI-X operation, you can use straight-through cables for all network connections to PCs or servers, or to other switches or hubs. In addition, it is ideal and preferred to use straight-through cable for switch-to-switch connections.

Each of these ports supports auto-negotiation, so the optimum transmission mode (half or full duplex), and the data rate (10, 100, or 1000 Mbps) can be selected automatically. If a device connected to one of these ports does not support auto-negotiation, the communication mode of the port can be configured manually.

Combination ports

FCX devices contain four combination ports, which are four Small Form Factor Pluggable (SFP) network interfaces (1F~4F) that are shared with four of the RJ45 ports (ports 1~4). In the default configuration, if an SFP transceiver is installed in a slot and has a valid link on its port, the associated RJ45 port is disabled and cannot be used. The switch can also be configured to force the use of a combination RJ45 port or SFP slot, as required.

NOTE
FCX624-E, FCX624-I, FCX648-E, and FCX648-I devices do not ship with SFP ports. You must install the optional SFP or SFP+ module for SFP support.

Slot designations

Table 2 lists the slot designations for FastIron CX models.

TABLE 2 Stack unit slots for FastIron stackable devices

Device	Slot 1	Slot 2	Slot 3
FCX624-S	20 10/100/1000 Mbps ports plus 4 Combo ports (RJ45 ports 1-4, or SFP ports 1F-4F)	16 Gbps uplink port on rear panel	Two 10 Gbps ports on front panel
FCX648-S	44 20 10/100/1000 Mbps ports plus 4 Combo ports (RJ45 ports 1-4, or SFP ports 1F-4F)	Two 16 Gbps ports on rear panel, or two Gbps XFP ports (optional module on front panel)	Two 10 Gbps ports on front panel
Brocade FCX 624S-F	20 10/100/1000 Mbps ports plus 4 Combo 1 Gbps ports on front panel	Two 16 Gbps ports on rear panel, or two Gbps XFP ports (optional module on front panel)	Two 10 Gbps ports on front panel (optional module)

TABLE 2 Stack unit slots for FastIron stackable devices (Continued)

Device	Slot 1	Slot 2	Slot 3
Brocade FCX 624-E and Brocade FCX 624-I devices with optional four-port 1 Gbps SFP module	20 10/100/1000 Mbps RJ45 ports, plus 4-port 1 Gbps SFP module (optional) combined with the first four 10/100/1000 Mbps RJ45 copper ports (acting as a Combo port).	N/A	Two 10 Gbps ports on front panel (optional module)
Brocade FCX 648-E and Brocade FCX 648-I devices with optional four-port 1 Gbps SFP module	40 10/100/1000 Mbps RJ45 ports, plus 4-port 1 Gbps SFP module (optional) combined with the first four 10/100/1000 Mbps RJ45 copper ports (acting as a Combo port).	N/A	Two 10 Gbps ports on front panel (optional module)
Brocade FCX 624-E and Brocade FCX 624-I devices with optional four-port 10 Gbps SFP+ module	24 10/100/1000 Mbps RJ45 ports	4-port 10 Gbps SFP+ module (optional) on front panel	N/A
Brocade FCX 648-E and Brocade FCX 648-I devices with optional four-port 10 Gbps SFP+ module	44 10/100/1000 Mbps ports on front panel	4-port 10 Gbps SFP+ module (optional) on front panel	N/A

SFP interfaces

Table 3 describes the network interfaces supported on FastIron CX devices.

TABLE 3 SFP network interfaces

Interface	Show Media Description
1000Base-BX-D	M-GBXD
1000Base-BX-U	M-GBXU
1000Base-LHA	M-LHA
1000Base-LHB	M-LHB
1000Base-LX	M-LX
1000Base-LH	M-LH
1000Base-SX	M-SX
1000Base-SX2	M-SX2
1000Base-T	C
100Base-T	C**

TABLE 3 SFP network interfaces

Interface	Show Media Description
10Base-T	C**
100Base-BX	M-FBX
100Base-FX	M-FX

Optional two-port 10 Gbps XFP uplink module

The Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, Brocade FCX 624S-HPOE, and Brocade FCX 648S-HPOE devices include a slot on the front panel for a two-port 10 Gbps XFP uplink module. This module operates at 10 Gbps full duplex.

NOTE
The 10 Gbps XFP module is not hot-swappable.

FIGURE 12 Two-port 10 Gbps XFP module

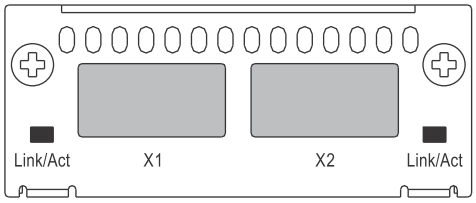


TABLE 4 10 Gbps XFP module port status LEDs

LED	Condition	Status
Link or Act LED (Link or Activity)	On or flashing Green	Port has a valid link at 10 Gbps. Flashing indicates activity.
	Off	The link is down.

Optional Four-port 1 Gbps SFP and 10 Gbps SFP+ modules

The FCX624-E, FCX624-I, FCX648-E, and FCX648-I devices include a slot on the front panel for a four-port 1 Gbps SFP module, or a four-port 10 Gbps SFP+ module. The 1 Gbps SFP module operates at 1 Gbps full duplex, and the 10 Gbps SFP+ module operates at 10 Gbps full duplex.

FCX-I and FCX-E devices can be used in an IronStack by installing the optional 10 Gbps SFP+ module, and connecting devices using standard duplex LC cables. These devices cannot be combined in a stack with non-FastIron CX devices. For detailed information about how to configure FastIron CX devices in an IronStack topology, see the *FastIron Configuration Guide*.

NOTE
The 1 Gbps SFP and 10 Gbps SFP+ modules are not hot-swappable.

FIGURE 13 Four-port 1 Gbps SFP module

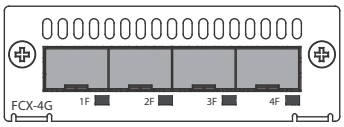


TABLE 5 Four-port 1 Gbps SFP module status LEDs

LED	Condition	Status
Link or Act LED (Link or Activity)	On or flashing Green	Port has a valid link at 1 Gbps. Flashing indicates activity.
	Off	The link is down.

FIGURE 14 Four-port 10 Gbps SFP+ module

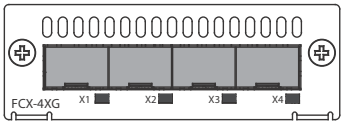


TABLE 6 Four-port 10 Gbps SFP+ module status LEDs

LED	Condition	Status
Link or Act LED (Link or Activity)	On or flashing Green	Port has a valid link at 10 Gbps. Flashing indicates activity.
	Off	The link is down.

NOTE
The two left ports on the SFP+ module do not pass regular Ethernet traffic by default. The **stack disable** CLI command must be configured on these two ports in order for them to pass regular traffic.

16/10 Gbps Ethernet CX4 stacking ports

The Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, Brocade FCX 624S-HPOE, and Brocade FCX 648S-HPOE devices include two 16/10 Gbps Ethernet CX4 ports on the rear panel (the stacking ports). The device can perform data transmission directly through copper links of up to 3 meters.

The Up Link and Down Link LEDs on the front panel indicate operational status. If the Up Link or Down Link LED is on, the port is connected. If the Up Link or Down Link LED is off, no connection exists, or the link is down.

Cable specifications for CX4 stacking ports

The following cable specifications apply to the CX4 stacking ports:

- Support for 802.3ak or 10 Gbps Ethernet CX4 standard and 16 Gbps inter-unit stacking (up to 8 units in a stack)
- Support for cables up to 3 meters in length
- Requires latch-style receptacle or SFF-8470 plug

NOTE
FCX624-E, FCX624-I, FCX648-E, and FCX648-I devices can be added to a stack using the first two ports on a four-port 10 Gbps SFP+ module (optional) using standard duplex LC cables.

Port, system, and power status LEDs for Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, FCX648-HPOE

FCX switches include a display panel for key system and port indicators that simplifies installation and network troubleshooting. The LEDs, which are located on the front panel for easy viewing, are shown below and described in the following tables.

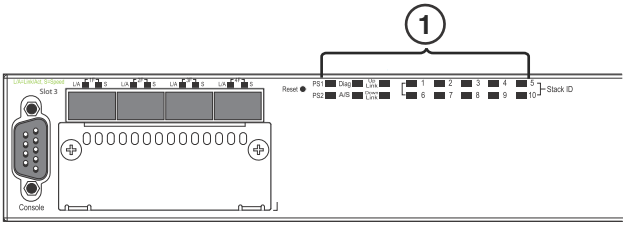
FIGURE 15 Port status LEDs

1, 2 Port status LEDs

TABLE 7 Port status LEDs

LED	Condition	Status
Ethernet (1~24/48) Link or Activity or Speed	On/Flashing Green	The port has established a valid link at 1000 Mbps. Flashing indicates the port is transmitting and receiving user packets.
	On/Flashing Amber	The port has established a valid link at 10 or 100 Mbps. Flashing indicates the port is transmitting and receiving user packets.
	Off	A link is not established with a remote port.
HPOE (1~24/48)	On Green	The port is providing HPOE power to a connected device.
	Off	The port is not providing HPOE power.
SFP (1F~4F) Link or Activity	On/Flashing Green	The SFP port has established a valid link. Flashing indicates the port is transmitting and receiving user packets.
	Off	A link is not established with a remote port.
SFP (1F~4F) Speed	On Green	The SFP port is operating at 1000 Mbps.
	On Amber	The SFP port is operating at 100 Mbps.
	Off	A link is not established with a remote port.

FIGURE 16 System status LEDs

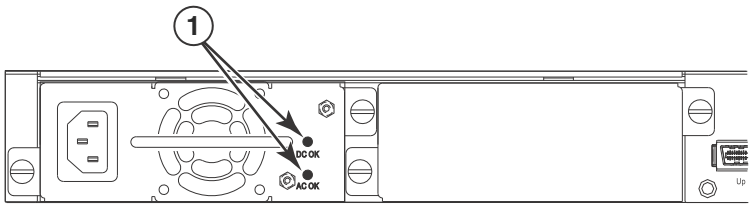


1 System status LEDs

TABLE 8 System status LEDs

LED	Condition	Status
PS1 PS2 (Power Supply Status)	Green	Power supply is operating normally.
	Amber	Power supply fault.
	Off	Power off or failure.
Diag (Diagnostic)	Flashing Green	System self-diagnostic test in progress.
	Green	System self-diagnostic test successfully completed.
	Amber	System self-diagnostic test has detected a fault. (Blower, thermal or any interface fault.)
A or S (Active or Standby)	Green	The device is the Active controller. If this LED is flashing green, the system is initializing.
	Amber	Indicates the device is the Standby controller.
	Off	Device is operating as a stack member, or is in standalone mode.
Up Link or Down Link (Stacking uplink or downlink port status)	Green	Uplink is operating normally.
	Off	Uplink has failed or there is no link.
Stack ID (1-8)	Green	Indicates the device stack ID.

FIGURE 17 Power status LEDs



1 Power status LEDs

TABLE 9 Power status LEDs

LED	Condition	Status
DC OK	Green	DC output ok
	Red	DC output fail
AC OK	Green	AC input ok
	Off	AC input fail

NOTE
Both “AC OK” and “DC OK” LEDs must be green for the device to function normally.

TABLE 10 Switch status for two installed power supply units

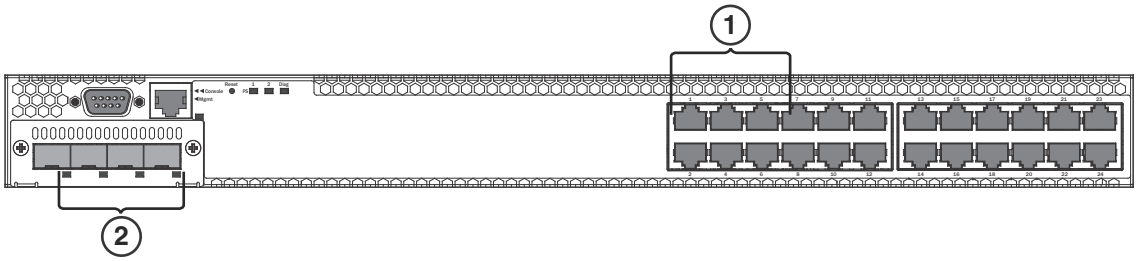
State	LED	PSU1	PSU2	Switch Status	Load Sharing	HPOE Budget (HPOE models only)
Four Green PSU LEDs	AC OK	Green	Green	Running	Yes	820W
	DC OK	Green	Green			
Single Red ‘DC OK’ LED	AC OK	Green	Green	Running	No	410W
	DC OK	Green	Red			
Both ‘DC OK’ LEDs Red	AC OK	Green	Green	Failure	No	None
	DC OK	Red	Red			
One PSU with both ‘AC OK’ ‘DC OK’ LEDs Off	AC OK	Green	Off	Running	No	410W
	DC OK	Green	Off			
‘DC OK’ LEDs Red and Off	AC OK	Green	Off	Failure	No	None
	DC OK	Red	Off			
All ‘AC OK’ LEDs Off	AC OK	Off	Off	Power Off or Failure	No	None
	DC OK	Off	Off			

NOTE
When two 620W power supplies are installed in an HPOE system that has no load or light load on the POE function, one of two power supplies may have its "DC OK" LED light red. There is no fault in the power supply or the system and the switch is functioning normally. The LED will turn to green automatically once the load is increased over the minimum load requirement. In configurations with a single power supply installed the "DC OK" LED will light green in a no-load or light-load condition.

Port, system, and power status LEDs for Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, Brocade FCX 648-I

FCX switches include a display panel for key system and port indicators that simplifies installation and network troubleshooting. The LEDs, which are located on the front panel for easy viewing, are shown below and described in the following tables.

FIGURE 18 Port status LEDs

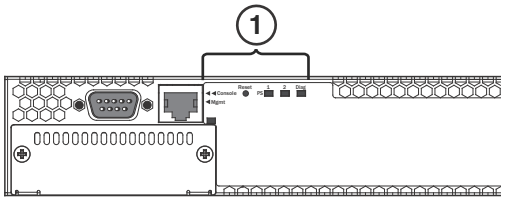


1 Port status LEDs 2 SFP or SFP+ port status LEDs

TABLE 11 Port status LEDs

LED	Condition	Status
Ethernet (1~24/48) Link or Activity or Speed	On/Flashing Green	The port has established a valid link at 10/100/1000 Mbps. Flashing indicates the port is transmitting and receiving user packets.
	Off	A link is not established with a remote port.
SFP (1F~4F) Link or Activity	On/Flashing Green	The SFP port has established a valid 100/1000 Mbps link. Flashing indicates the port is transmitting and receiving user packets.
	Off	A link is not established with a remote port.
SFP+ (1F~4F) Link or Activity	On/Flashing Green	The SFP+ port has established a valid 10 Gbps link. Flashing indicates the port is transmitting and receiving user packets.
	Off	A link is not established with a remote port.

FIGURE 19 System status LEDs

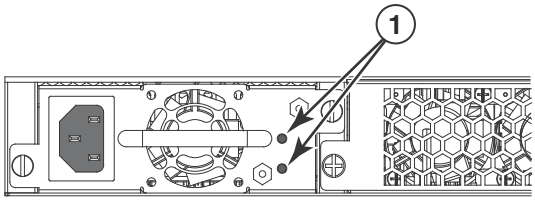


1 System status LEDs

TABLE 12 System status LEDs

LED	Condition	Status
PS1 PS2 (Power Supply Status)	Green	Power supply is operating normally. It is installed properly and the power cord is attached to a power source.
	Amber	Power supply fault. The power supply may not be installed properly.
	Off	Power off or failure.
Diag (Diagnostic)	Flashing Green	System self-diagnostic test in progress.
	Green	System self-diagnostic test successfully completed.
	Amber	System self-diagnostic test has detected a fault. (Blower, thermal or any interface fault.)
Out-of-band Management Link or Activity	On/Flashing Green	The port has established a valid link at 10/100/1000 Mbps. Flashing indicates the port is transmitting and receiving user packets.
	Off	A link is not established with a remote port.

FIGURE 20 Power status LEDs



1 Power status LEDs

TABLE 13 Power status LEDs

LED	Condition	Status
DC OK	Green	DC output ok
	Red	DC output fail
AC OK	Green	AC input ok
	Off	AC input fail

NOTE
Both “AC OK” and “DC OK” LEDs must be green for the device to function normally.

TABLE 14 Switch status for two installed power supply units

State	LED	PSU1	PSU2	Switch Status	Redundancy
Four Green PSU LEDs	AC OK	Green	Green	Running	Yes
	DC OK	Green	Green		
Single Red ‘DC OK’ LED	AC OK	Green	Green	Running	No
	DC OK	Green	Red		

TABLE 14 Switch status for two installed power supply units (Continued)

State	LED	PSU1	PSU2	Switch Status	Redundancy
Both 'DC OK' LEDs Red	AC OK	Green	Green	Failure	No
	DC OK	Red	Red		
One PSU with both 'AC OK' 'DC OK' LEDs Off	AC OK	Green	Off	Running	No
	DC OK	Green	Off		
'DC OK' LEDs Red and Off	AC OK	Green	Off	Failure	No
	DC OK	Red	Off		
All 'AC OK' LEDs Off	AC OK	Off	Off	Power Off or Failure	No
	DC OK	Off	Off		

Power supplies

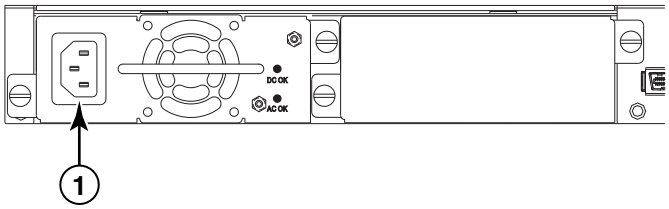
The device has two power receptacles on the rear panel. Each device ships with one power supply installed. Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E and Brocade FCX 648-I devices use a 210W PSU. Brocade FCX 624S-HPOE and Brocade FCX 648S-HPOE devices use a 620W PSU.

Each power supply has one standard power receptacle for the AC power cable, and AC and DC status LEDs for easy monitoring and troubleshooting.

A secondary power supply can be installed to provide backup power in case of a failure and for load-balancing when both power suppies are operational.Load-balancing gives the power supplies a longer life span. Both 210W and 620W PSUs are hot-swappable.

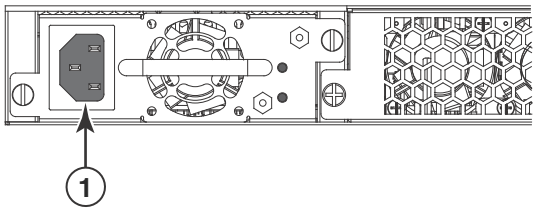
For instructions on installing and replacing a power supply refer to "Installing and replacing a power supply unit" on page 28. For information on LED status refer to Table 9.

FIGURE 21 **Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, Brocade FCX 624S-HPOE and Brocade FCX 648S-HPOE AC power supply receptacle**



1 AC power receptacle

FIGURE 22 Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E and Brocade FCX 648-I AC power supply receptacle



1 AC power receptacle

Power supply unit operation

When only one PSU is installed, both "AC OK" and "DC OK" LEDs on the installed PSU must be green for the FastIron CX device to function normally.

When two PSUs are installed, both "AC OK" and "DC OK" LEDs for one of the installed PSUs must be green for the FastIron CX device to function normally.

HPOE and HPOE + power supplies

Brocade FCX 624S-HPOE and Brocade FCX 648S-HPOE devices use a 620W PSU. When one PSU is powering the switch, the HPOE budget is 410W. If both PSUs are installed and powering the switch, each PSU provides 410W to the switch, increasing the HPOE budget to 820W.

Chapter

Installing the FastIron CX Switch

2

CAUTION

The procedures in this manual are intended for qualified service personnel.

CAUTION

Before beginning the installation, see the precautions in "Power precautions" on page 19.

Unpacking the device

FastIron CX devices ship with all of the items listed below. Verify the contents of your shipping container. If any items are missing, please contact the place of purchase.

Package contents

The following items are included in your shipping carton:

- FastIron CX device
- 115V AC power cable (for AC sourced devices)
- FCX-S devices ship with a .5M CX-4 stacking cable
- Rack mount brackets
- Warranty card
- A straight-through EIA or TIA DB-9 serial cable (F/F). The serial cable can be ordered separately from Brocade. If you prefer to build your own cable, see the pinout information in "Attaching a PC or terminal" on page 27.

General requirements

To manage the system, you need a management station, such as a PC running a terminal emulation application. Connect the management station to the Console serial port on the switch.

Use the serial connection to perform basic configuration tasks, including assigning an IP address and network mask to the system. This information is required to manage the system using the Web management interface or IronView Network Manager or using the CLI through Telnet.

Installation tasks

Follow the steps listed in Table 15 to install your device. Details for each of these steps are provided on the pages indicated.

TABLE 15 Installation tasks

Task Number	Task	Where to Find More Information
1	Ensure that the physical environment that will host the device has the proper cabling and ventilation.	"Preparing the installation site" on page 20
2	Install any required optional modules into the switch.	"Powering on the system" on page 26
3	Install the Brocade device on a desktop, in an equipment rack.	"Installing the device" on page 20
4	Once the device is physically installed, plug the device into a nearby power source that adheres to the regulatory requirements outlined in this manual.	"Powering on the system" on page 26
5	Attach a terminal or PC to the Brocade device. This will enable you to configure the device through the *Command Line Interface (CLI)*.	"Attaching a PC or terminal" on page 27
6	No default password is assigned to the CLI. For additional access security, assign a password.	"Assigning permanent passwords" on page 35
7	Before attaching equipment to the device, you need to configure an interface IP address to the subnet on which it will be located. Initial IP address configuration is performed using the CLI with a direct serial connection. Subsequent IP address configuration can be performed using the Web management interface.	"Configuring IP addresses" on page 37
8	Once you power on the device and assign IP addresses, the system is ready to accept network equipment.	"Configuring IP parameters for devices running Layer 3 software" on page 39
9	Test IP connectivity to other devices by pinging them and tracing routes.	"Testing connectivity" on page 45
10	Continue configuring the device using the CLI or the Web management interface. You also can use IronView Network Manager to manage the device.	*FastIron Configuration Guide*
11	Secure access to the device.	*FastIron Configuration Guide*

Installation precautions

Follow all precautions when installing a Brocade device.

General precautions

CAUTION

All fiber-optic interfaces use Class 1 lasers.

CAUTION

Do not install the device in an environment where the operating ambient temperature might exceed 40° C (104° F).

CAUTION

Make sure the air flow around the front and sides of the device is not restricted.

CAUTION

Never leave tools inside the device.

Lifting precautions

CAUTION

Make sure the rack or cabinet housing the device is adequately secured to prevent it from becoming unstable or falling over.

Power precautions

CAUTION

Use a separate branch circuit for each AC power cord, which provides redundancy in case one of the circuits fails.

CAUTION

To avoid high voltage shock, do not open the device while the power is on.

CAUTION

Ensure that the device does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add the ampere (amp) ratings of all devices installed on the same circuit as the device. Compare this total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices near the input power connectors.

CAUTION

Disconnect the power cord from all power sources to completely remove power from the device.

CAUTION

If the installation requires a different power cord than the one supplied with the device, make sure you use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the device.

Preparing the installation site

Cabling infrastructure

Ensure that the proper cabling is installed at the site. Refer to "Hardware Specifications" on page 59 or *www.brocade.com* for a summary of supported cabling types and their specifications.

Installation location

Before installing the device, plan its location and orientation relative to other devices and equipment. Switches can be mounted in a standard 19-inch equipment rack that meets EIA-310D standards, or on a flat surface. Be sure to follow the guidelines below when choosing a location.

The site should meet the following requirements:

- Maintain temperatures within 0 to 40^{O}C (32 to 104^{O}F) and humidity levels within 5% to 95%, non-condensing.
- Allow a minimum of 3 in. of space between the sides and the back of the device and walls or other obstructions for proper air flow.
- Allow at least 3 in. of space at the front and back of the device for the twisted-pair, fiber-optic, and power cabling.
- Be accessible for installing, cabling and maintaining the devices.
- Allow the status LEDs to be clearly visible.
- Allow for twisted-pair cable to be always routed away from power lines, fluorescent lighting fixtures and other sources of electrical interference, such as radios and transmitters.
- Allow for the unit to be connected to a separate grounded power outlet that provides 110 to 240 VAC, 50 to 60 Hz, is within 2 m (6.6 feet) of each device and is powered from an independent circuit breaker. As with any equipment, a filter or surge suppressor is recommended.

Installing the device

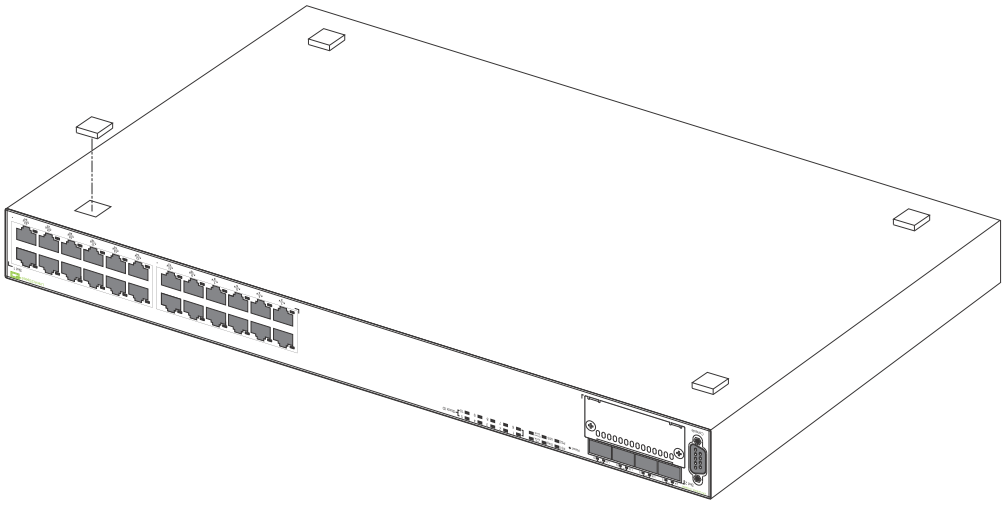
You can install Brocade devices on a desktop or in an equipment rack.

CAUTION

Make sure the rack or cabinet housing the device is adequately secured to prevent it from becoming unstable or falling over.

Desktop installation

FIGURE 23 Attaching the adhesive feet



1. Attach the four adhesive feet to the bottom of the first switch.
2. Set the device on a flat desktop, table, or shelf near an AC power source. Make sure that adequate ventilation is provided for the system. A 3 inch clearance is recommended on each side.
3. If installing a single switch only, refer to "Powering on the system" on page 26.
4. If installing multiple switches, attach the adhesive feet to each one. Place each device squarely on top of the one below, in any order.

Rack mount installation

NOTE

You need a #2 Phillips screwdriver for installation.

Before mounting the switch in a rack, pay particular attention to the following factors:

- Temperature: Since the temperature within a rack assembly may be higher than the ambient room temperature, check that the rack-environment temperature is within the specified operating temperature range. (Refer to "Operating Environment" on page 59.)
- Mechanical loading: Do not place any equipment on top of a rack-mounted unit.
- Circuit overloading: Be sure that the supply circuit to the rack assembly is not overloaded.

- Grounding: Rack-mounted equipment should be properly grounded. Particular attention should be given to supply connections other than direct connections to the mains.

Use the following setps to mount devices in rack.

1. Remove the rack mount kit from the shipping carton. The kit contains two L-shaped mounting brackets and mounting screws.
2. Attach the mounting brackets to the sides of the device as illustrated in Figure 24 and Figure 25.

NOTE
FCX624-E, FCX624-I, FCX648-E, and FCX648-I device brackets are mounted using three screws, as shown in Figure 25.

FIGURE 24 Attaching the Brackets for Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, FCX648-HPOE

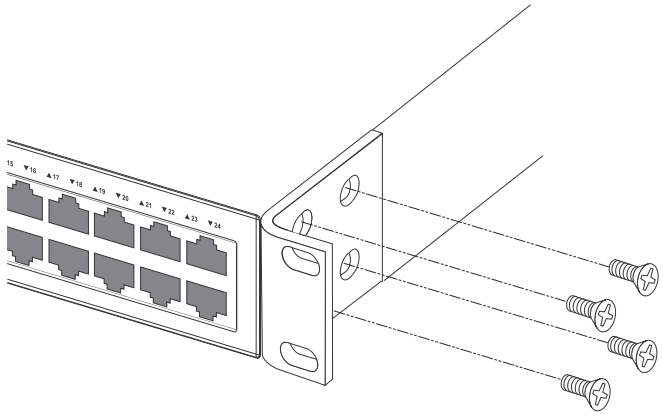
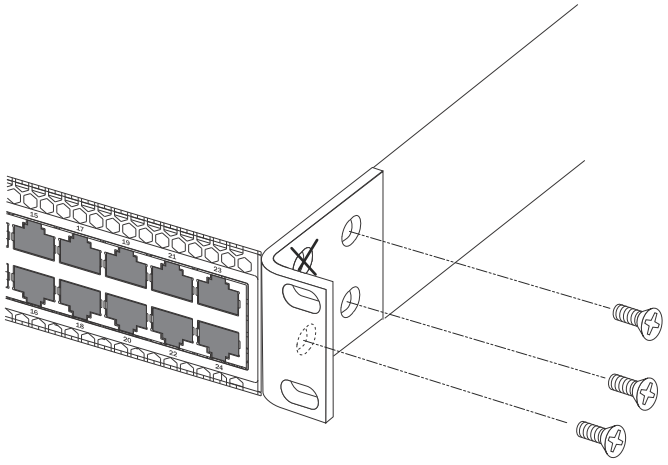
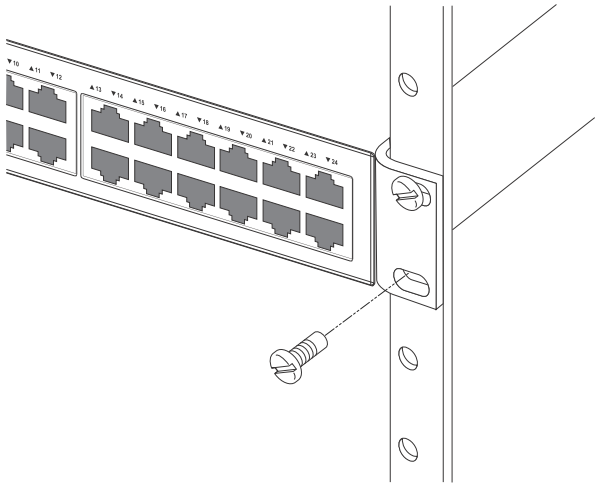


FIGURE 25 Attaching the brackets for Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, and Brocade FCX 648-I



3. Attach the device in the rack as illustrated in Figure 26.

FIGURE 26 Installing the device in a rack



4. If installing a single switch only, proceed to "Powering on the system" on page 26.
5. If installing multiple switches, mount them in the rack, one below the other, in any order.

Connecting devices in a stack

Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, FCX648-HPOE devices

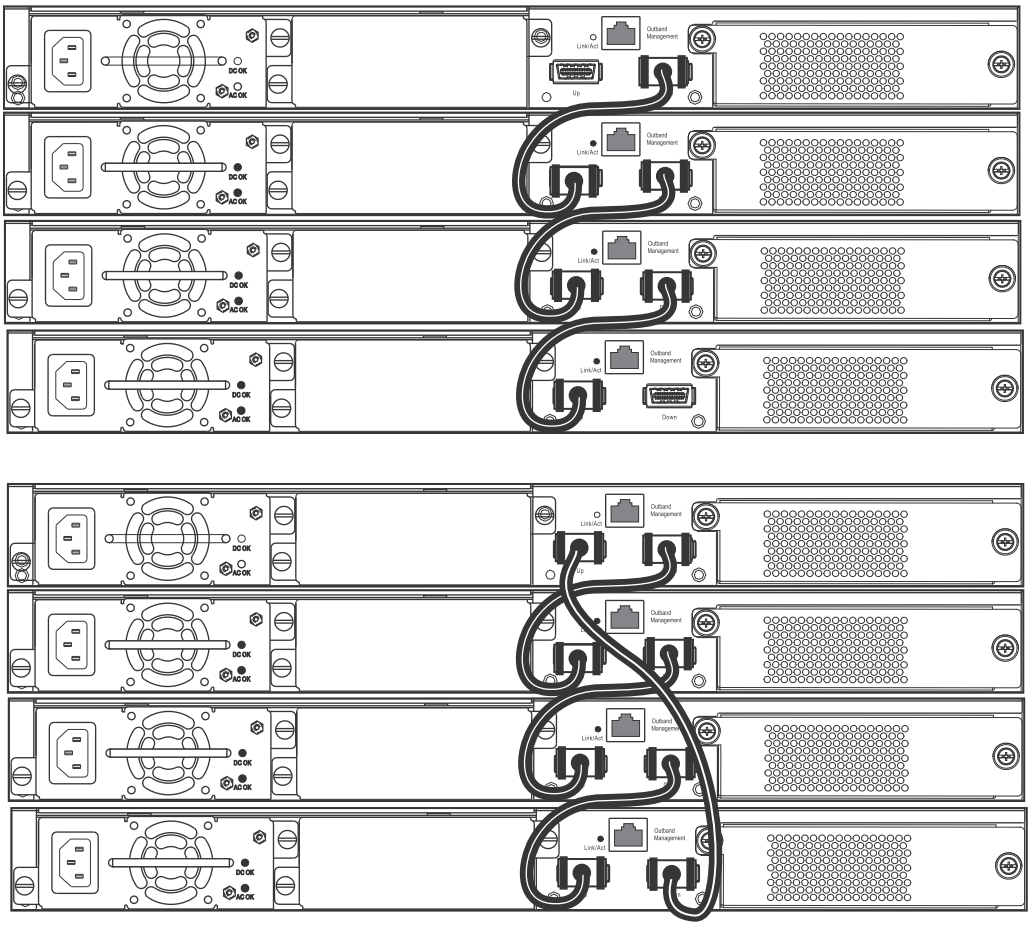
Figure 5 shows how the stack cables are connected between switches in a stack. The connection is based on 10G/16G Gigabit Ethernet, using CX4 cables. FastIron CX devices support linear and ring stack topologies, and can also operate as standalone devices.

In a linear stack topology there is a single stack cable connection between each switch that carries two-way communications across the stack. In ring stack topology, an extra cable is connected between the top and bottom switches forming a "ring" or "closed-loop." The closed-loop cable provides a redundant path for the stack link, so if one link fails, stack communications can be maintained. Figure 5 illustrates a ring-topology stacking configuration.

You can form a stack containing up to eight FastIron CX units. To connect switches in a stack, perform the following steps:

1. Plug one end of a stack cable into one of the CX4 stacking ports of the top unit.
2. Plug the other end of the stack cable into one of the stacking ports of the next unit.
3. Repeat steps 1 and 2 for each unit in the stack. Form a simple chain starting with a stacking port on the top unit and ending at a stacking port on the bottom unit (stacking up to eight units).
4. (Optional) To form a ring stack topology, plug one end of a stack cable into the remaining stacking port on the bottom unit and the other end into the remaining stacking port on the top unit.

FIGURE 27 Connecting switches in a linear (top) and ring (bottom) topology stack



5. One device in the stack will operate as the Active Controller, one will operate as Standby Controller, with the rest of the units operating as stack members. For information about how to configure your stack, see the *FastIron Configuration Guide*.

Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, Brocade FCX 648-I devices

Figure 28 and Figure 29 show how stacking cables are connected between FCX624-E, FCX624-I, FCX648-E, and FCX648-I devices in a stack. The connection is based on 10 Gbps SFP+ using LC-LC MM Fiber cables. These devices support linear and ring stack topologies with the optional SFP+ modules installed, and can also operate in standalone mode.

NOTE
FCX624-E, FCX624-I, FCX648-E, and FCX648-I devices must have a 4-port 10 Gbps SFP+ module (optional) installed to operate in a stack.

Figure 30 shows a stack containing FCX624-E, FCX624-I, FCX648-E, and FCX648-I devices and another FCX device. Using FCX624-E, FCX624-I, FCX648-E, and FCX648-I devices in this type of mixed stack requires your to reconfigure the default stacking ports on the other FCX device. For more information, see the *FastIron Configuration Guide*.

You can form a stack containing up to eight FCX624-E, FCX624-I, FCX648-E, and FCX648-I units. To connect switches in a stack, perform the following steps:

1. Plug one end of an LC-LC MM Fiber cable into one of the SFP+ stacking ports of the top unit.
2. Plug the other end of the cable into one of the stacking ports of the next unit.
3. Repeat steps 1 and 2 for each unit in the stack. Form a simple chain starting with a stacking port on the top unit and ending at a stacking port on the bottom unit (stacking up to eight units). See Figure 28
4. (Optional) To form a ring stack topology, plug one end of an LC-LC MM Fiber cable into the remaining stacking port on the bottom unit and the other end into the remaining stacking port on the top unit. See Figure 29.

FIGURE 28 Connecting Brocade FCX 624-E and Brocade FCX 648-E devices in a linear stack topology

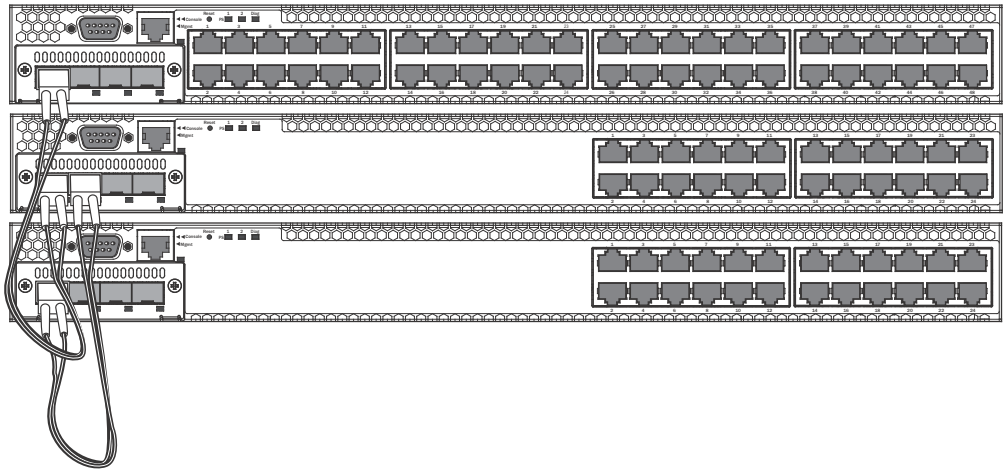


FIGURE 29 Connecting Brocade FCX 624-E and Brocade FCX 648-E devices in a ring stack topology

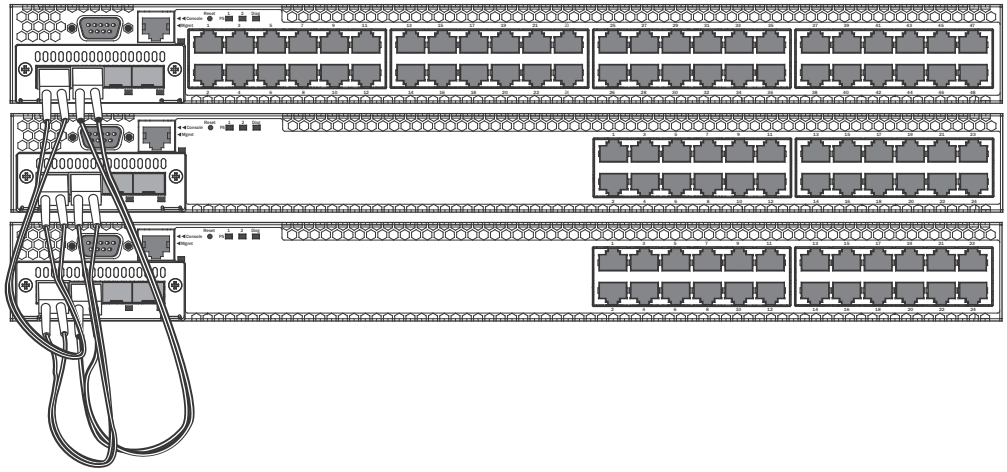
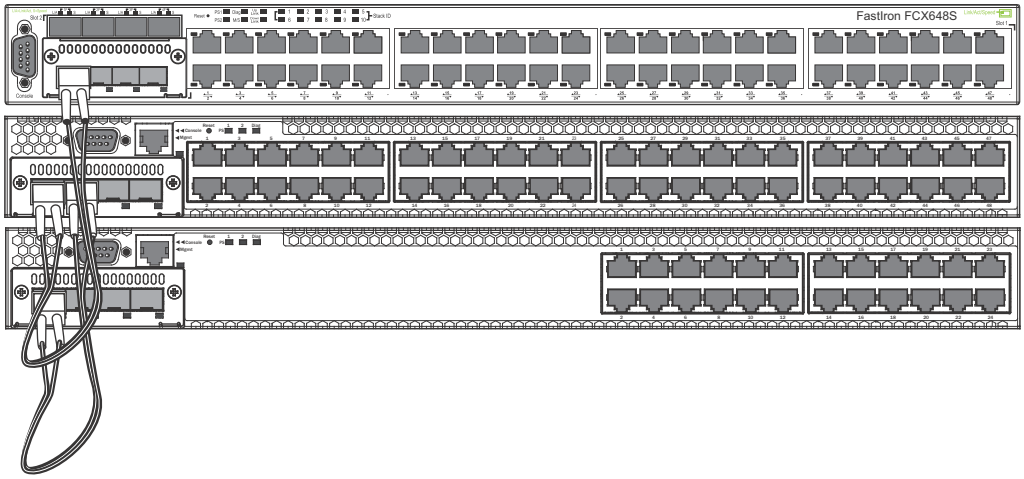


FIGURE 30 Connecting Brocade FCX 624-E and Brocade FCX 648-E devices in a mixed stack with an Brocade FCX 648S device



Powering on the system

After you complete the physical installation, you can power on the system.

1. Remove the power cable from the shipping package.
2. Attach the AC power cable to the AC connector on the rear panel.
3. Insert the power cable plug into a 115V, 120V, or 240V outlet.

NOTE
To turn the system off, simply unplug the power cable or cables.

NOTE
The socket should be installed near the equipment and should be easily accessible.

NOTE
If the outlet is not rated 115/120V, stop and get the appropriate cable for the outlet.

Attaching a PC or terminal

To assign an IP address, you must have access to the ***Command Line Interface (CLI)***. The CLI is a text-based interface that can be accessed through a direct serial connection to the device and through Telnet connections. The CLI is described in detail in the *FastIron Configuration Guide*.

Access the CLI by attaching a serial cable to the Console port. After you assign an IP address, you can access the system through Telnet, the Web management interface, or IronView Network Manager.

Use the following steps to attach a management station to the serial port.

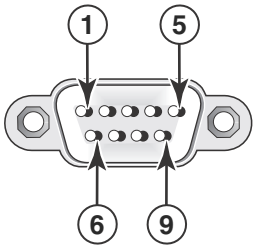
1. Connect a PC or terminal to the serial port of the system using a straight-through cable. The serial port has a male DB-9 connector. See Figure 31.

   NOTE
   You need to run a terminal emulation program on the PC.

2. Launch the terminal emulation program and set the following session parameters:
   - Baud: 9600 bps
   - Data bits: 8
   - Parity: None
   - Stop bits: 1
   - Flow control: None

The EIA or TIA 232 serial communication port serves as a connection point for management by a PC or SNMP workstation. Brocade devices come with a standard male DB-9 connector, shown in Figure 31.

FIGURE 31 Serial Port (DB-9 DTE) Pin-Out



Most PC serial ports also require a cable with a female DB-9 connector. Terminal connections will vary, requiring either a DB-9 or DB-25 connector, male or female. Serial cable options between a Brocade device and a PC or terminal are shown in Table 16.

Wiring map for serial cable

TABLE 16 Serial cable wiring

Switch 9-Pin Serial Port	Null Modem	PC 9-Pin DTE Port
2 TXD (transmit data)	---------->	2 RXD (receive data)
3 RXD (receive data)	<----------	3 TXD (transmit data)
5 SGND (signal ground)	<---------->	5 SGND (signal ground)
No other pins are used.		

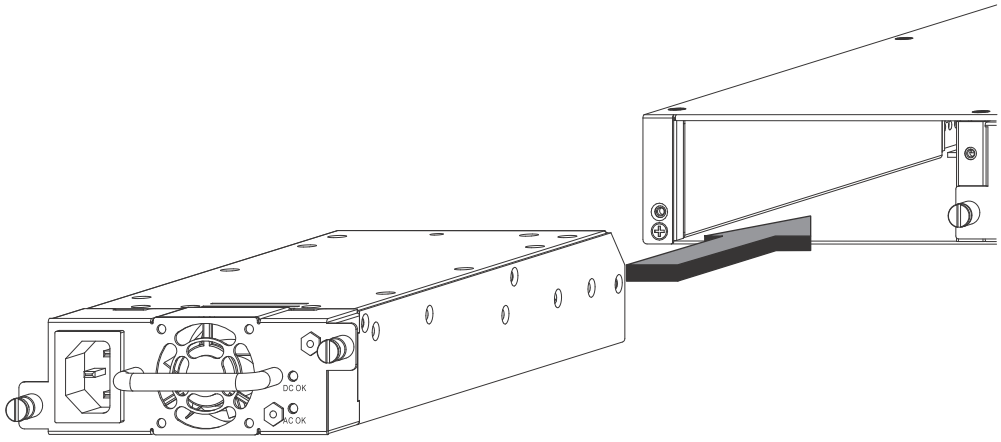
NOTE
As indicated in Table 16, some of the wires should not be connected.

Installing and replacing a power supply unit

CAUTION

For the Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, and Brocade FCX 648-I devices, be sure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I" as shown in Table 1 on page 5.

FIGURE 32 Installing a power supply unit



Use the following steps to install a power supply unit in the switch.

1. Remove the blank metal plate (or a previously installed PSU) from the appropriate slot by removing the two screws with a flat-head screwdriver.
2. Before opening the package that contains the PSU, touch the bag to the switch casing to discharge any potential static electricity. Brocade recommends using an ESD wrist strap during installation.
3. Remove the PSU from the anti-static shielded bag.
4. Holding the PSU level, guide it into the carrier rails on each side and gently push it all the way into the slot, ensuring that it firmly engages with the connector.
5. When you are sure the PSU has properly engaged the connector, tighten the retainer screws to secure the in PSU the slot.

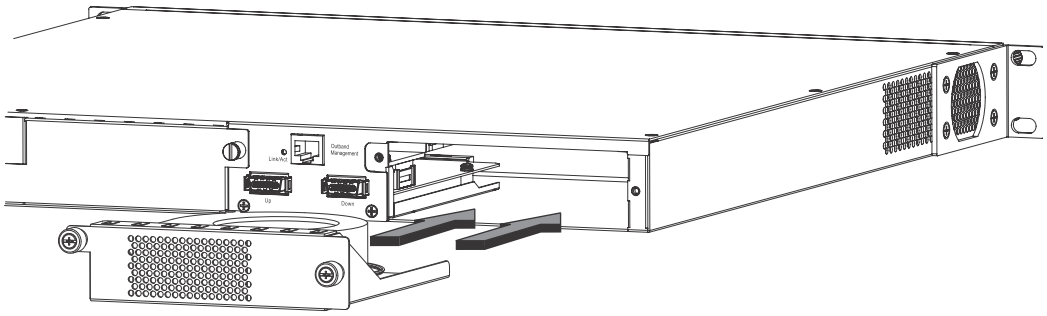
When the device is powered on, the PSU AC and DC LEDs on the PSU back panel should turn green to confirm that the PSU is correctly installed and supplying power.

CAUTION

If you do not install a PSU in a slot, you must keep the slot panel in place. If you run the device with an uncovered slot, the system will overheat.

Installing or replacing fan trays on Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, and FCX648-HPOE devices

FIGURE 33 Installing a fan tray on a Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, or FCX648-HPOE device



Perform the following steps to install a fan tray in the switch.

1. Remove the installed fan tray from the slot by removing the two screws with a crosshead or Philips screwdriver.
2. Before opening the package that contains the new fan tray, touch the bag to the switch casing to discharge any potential static electricity. It is recommended that you wear an ESD wrist strap during installation.

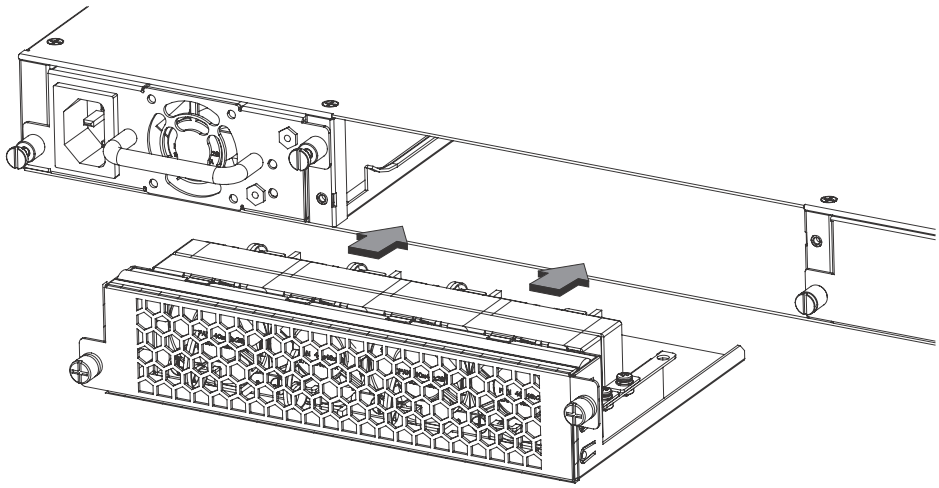
3. Remove the fan tray from the anti-static shielded bag.
4. Holding the fan tray level, guide it into the carrier rails on each side and gently push it all the way into the slot, ensuring that it firmly engages with the connector.
5. When you are sure the fan tray has properly engaged the connector, tighten the retainer screws to secure the fan tray in the slot.

NOTE
The fans are controlled by software, and their speed is set according to the environmental temperature surrounding the switch.

Installing or replacing fan trays on Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, and Brocade FCX 648-I devices

CAUTION
For Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, and Brocade FCX 648-I devices, be sure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I" as shown in Table 1 on page 5.

FIGURE 34 Installing a fan tray on a Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, or Brocade FCX 648-I device



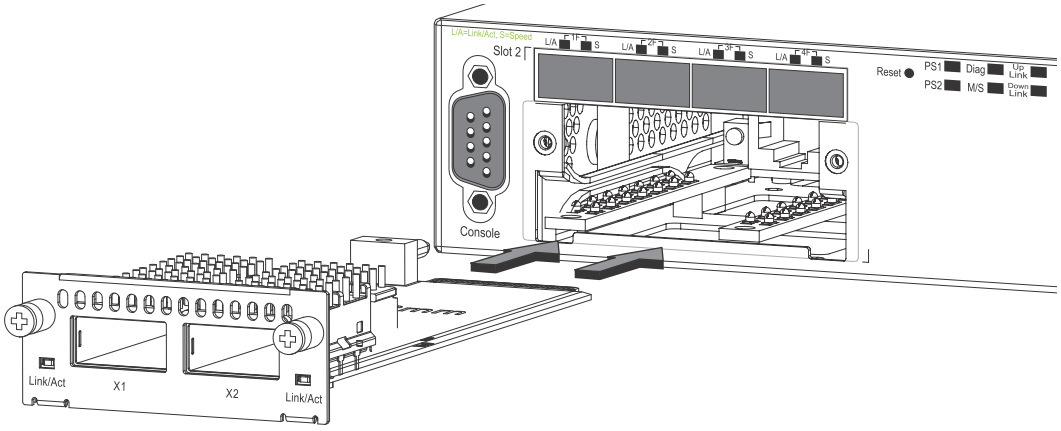
Fan trays are hot-swappable. Perform the following steps to install a fan tray in the switch.

1. Remove the installed fan tray from the slot by removing the two screws with a crosshead or Philips screwdriver.
2. Before opening the package that contains the new fan tray, touch the bag to the switch casing to discharge any potential static electricity. It is recommended that you wear an ESD wrist strap during installation.
3. Remove the fan tray from the anti-static shielded bag.
4. Holding the fan tray level, guide it into the carrier rails on each side and gently push it all the way into the slot, ensuring that it firmly engages with the connector.
5. When you are sure the fan tray has properly engaged the connector, tighten the retainer screws to secure the fan tray in the slot.

NOTE
The fans are controlled by software, and their speed is set according to the environmental temperature surrounding the switch.

Installing an optional module on Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, or FCX648-HPOE devices

FIGURE 35 Installing an optional module



Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, and FCX648-HPOE switches support an optional two-port 10 Gbps Ethernet XFP module.

Perform these steps to install an optional module.

1. Remove the blank metal plate (or an installed module) from the slot by removing the two screws with a Phillips screwdriver.
2. Before opening the package that contains the module, touch the bag to the switch casing to discharge any potential static electricity. It is recommended that you wear an ESD wrist strap during installation.
3. Remove the module from the anti-static shielded bag.
4. Holding the module level, guide it into the carrier rails on each side and gently push it all the way into the slot, ensuring that it firmly engages with the connector.
5. When you are sure the module has properly engaged the connector, tighten the retainer screws to secure the module in the slot.
6. When the switch is powered on, the LEDs will function as described in "Port, system, and power status LEDs for Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, FCX648-HPOE" on page 10.

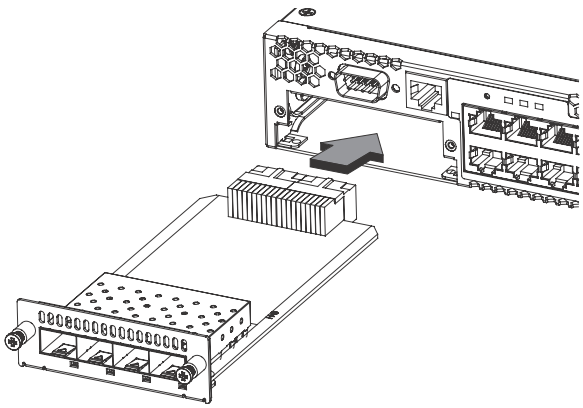
CAUTION

If you do not install a module in a slot, you must keep the slot panel in place. If you run the device with an uncovered slot, the system will overheat.

Installing an optional module in Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, and Brocade FCX 648-I devices

FCX624-E, FCX624-I, FCX648-E, and FCX648-I switches support an optional four-port 1 Gbps SFP module or four-port 10 Gbps SFP+ module. The 10 Gbps SFP+ module allows you to use your device in a stack. Figure 36 shows how to install an optional SFP or SFP+ module.

FIGURE 36 Installing an optional module in Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 624-E and Brocade FCX 648-E devices



CAUTION

Optional SFP and SFP+ modules are not hot-swappable. Be sure to power-down your device before you install or replace a module.

Perform these steps to install an optional module.

1. Remove the blank metal plate (or a installed module) from the slot by removing the two screws with a Phillips screwdriver.
2. Before opening the module package, touch the bag to the switch casing to discharge any static electricity. It is recommended that you wear an ESD wrist strap during installation.
3. Remove the module from the anti-static shielded bag.
4. Hold the module level, guide it into the carrier rails and gently push it into the slot until it firmly engages with the connector.
5. When the module is engaged, tighten the retainer screws to secure the module in the slot.
6. When the switch is powered on, the LEDs will follow the LED status as described in "Port, system, and power status LEDs for Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, Brocade FCX 648-I" on page 13.

NOTE

If you want ports 1 and 2 on the 10 Gbps module to pass regular Ethernet traffic, you must first disable stacking on these ports. For more information, see the *FastIron Configuration Guide*

CAUTION

If you do not install a module in a slot, you must keep the slot panel in place. If you run the device with an uncovered slot, the system will overheat.

Chapter

Checking Network Devices and Testing Connectivity 3

CAUTION

The procedures in this manual are for qualified service personnel.

Assigning permanent passwords

By default, the CLI is not protected by passwords. To secure CLI access, Brocade strongly recommends assigning passwords. See the *FastIron Configuration Guide*.

NOTE
You cannot assign a password using the Web management interface. You can assign passwords using IronView Network Manager if an enable password for a Super User has been configured on the device.

The CLI contains the following access levels:

- **User EXEC** – The level you enter when you first start a CLI session. At this level, you can view some system information but you cannot configure system or port parameters.
- **Privileged EXEC** – This level is also called the Enable level and can be secured by a password. You can perform tasks such as manage files on the flash module, save the system configuration to flash, and clear caches at this level.
- **CONFIG** – The configuration level. This level lets you configure the system IP address and configure switching and routing features. To access the CONFIG mode, you must already be logged into the Privileged level of the EXEC mode.

You can set the following levels of Enable passwords:

- **Super User** – Allows complete read-and-write access to the system. This is generally for system administrators and is the only password level that allows you to configure passwords.

  NOTE
  You must set a super user password before you can set other types of passwords.

- **Port Configuration** – Allows read-and-write access for specific ports but not for global (system-wide) parameters.
- **Read Only** – Allows access to the Privileged EXEC mode and CONFIG mode but only with read access.

Setting passwords

1. At the opening CLI prompt, enter the following command to change to the Privileged level of the EXEC mode:

   ```
   Brocade> enable
   ```

2. Access the CONFIG level of the CLI by entering the following command:

   ```
   Brocade# configure terminal
   Brocade(config)#
   ```

3. Enter the following command to set the super user password:

   ```
   Brocade(config)# enable super-user-password <text>
   ```

   NOTE
   You must set the super user password before you can set other types of passwords.

4. Enter the following commands to set the port configuration and read-only passwords:

   ```
   Brocade(config)# enable port-config-password <text>
   Brocade(config)# enable read-only-password <text>
   ```

   NOTE
   If you forget your super user password, refer to "Recovering from a lost password" on page 36.

   Syntax: **enable super-user-password** | **read-only-password** | **port-config-password** <*text*>

   Passwords can be up to 32 characters long.

Recovering from a lost password

By default, the CLI does not require passwords. However, if someone has configured a password for the device but the password has been lost, you can regain super user access to the device using the following procedure.

NOTE
Recovery from a lost password requires direct access to the serial port and a system reset.

Use the following procedure to recover from a lost password.

1. Start a CLI session over the serial interface to the Brocade device.
2. Reboot the device.
3. While the system is booting, before the initial system prompt appears, enter **b** to enter the boot monitor mode.
4. Enter **no password** at the prompt. (You cannot abbreviate this command.)
5. Enter **boot system flash primary** at the prompt. This command causes the device to bypass the system password check.

After the console prompt reappears, assign a new password.

Configuring IP addresses

You must configure at least one IP address using the serial connection to the CLI before you can manage the system using the other management interfaces.

Brocade devices support both classical IP network masks (Class A, B, and C subnet masks, and so on) and Classless Interdomain Routing (CIDR) network prefix masks.

- To enter a classical network mask, enter the mask in IP address format. For example, enter "209.157.22.99 255.255.255.0" for an IP address with a Class-C subnet mask.
- To enter a prefix number for a network mask, enter a forward slash (/) and the number of bits in the mask immediately after the IP address. For example, enter "209.157.22.99/24" for an IP address that has a network mask with 24 significant ("mask") bits.

By default, the CLI displays network masks in classical IP address format (example: 255.255.255.0). You can change the display to the prefix format. See the *FastIron Configuration Guide*.

Devices running Layer 2 software

Use the following procedure to configure an IP Address on a device running Layer 2 software.

1. At the opening CLI prompt, enter **enable**.

   ```
   Brocade> enable
   ```

2. Enter the following command at the Privileged EXEC level prompt (for example, Brocade FCX#), then press **Enter**. This command erases the factory test configuration if still present:

   ```
   Brocade# erase startup-config
   ```

CAUTION

Use the erase startup-config command only for new systems. If you enter this command on a system you have already configured, the command erases the configuration. If you accidentally do erase the configuration on a configured system, enter the write memory command to save the running configuration to the startup-config file.

3. Access the configuration level of the CLI by entering the following command:

   ```
   Brocade# configure terminal (Privileged EXEC Level)
   Brocade(config)# (Global CONFIG Level)
   ```

4. Configure the IP address and mask for the switch.

   ```
   Brocade(config)# ip address 192.22.3.44 255.255.255.0
   ```

5. Set a default gateway address for the switch.

   ```
   Brocade(config)# ip default-gateway 192.22.3.1
   ```

NOTE
You do not need to assign a default gateway address for single subnet networks.

Syntax: enable [<*password*>]

Syntax: configure terminal

Syntax: [**no**] **ip address** <*ip-addr*> <*ip-mask*>

or

Syntax: [**no**] **ip address** <*ip-addr*>/<*mask-bits*>

Syntax: **ip default-gateway** <*ip-addr*>

Devices running Layer 3 software

Before attaching equipment to a Brocade Layer 3 Switch, you must assign an interface IP address to the subnet on which the router will be located. You must use the serial connection to assign the first IP address. For subsequent addresses, you also can use the CLI through Telnet or the Web management interface.

By default, you can configure up to 24 IP interfaces on each port, virtual interface, and loopback interface. You can increase this amount to up to 64 IP subnet addresses per port by increasing the size of the subnet-per-interface table.

The following procedure shows how to add an IP address and mask to a router port.

1. At the opening CLI prompt, enter **enable**.

```
Brocade> enable
```

2. Enter the following command at the CLI Privileged EXEC level prompt, then press Enter. This command erases the factory test configuration if still present:

```
Brocade# erase startup-config
```

CAUTION

Use the erase startup-config command only for new systems. If you enter this command on a system you have already configured, the command erases the configuration. If you accidentally do erase the configuration on a configured system, enter the write memory command to save the running configuration to the startup-config file.

3. Access the configuration level of the CLI by entering the following command:

```
Brocade# configure terminal    Privileged EXEC Level
Brocade(config)#               Global CONFIG Level
```

4. Configure the IP addresses and mask addresses for the interfaces on the router.

```
Brocade(config)# int e 2
Brocade(config-if-e1000-2)# ip address 192.22.3.44 255.255.255.0
```

NOTE

You can use the syntax **ip address** <*ip-addr*>/<*mask-bits*> if you know the subnet mask length. In the above example, you could enter **ip address 192.22.3.44/24**.

Syntax: **enable** [<*password*>]

Syntax: configure terminal

Syntax: [**no**] **ip address** <*ip-addr*> <*ip-mask*> [**secondary**]

or

Syntax: [**no**] **ip address** <*ip-addr*>/<*mask-bits*> [**secondary**]

Use the **secondary** parameter if you have already configured an IP address within the same subnet on the interface.

Configuring IP parameters for devices running Layer 3 software

This section describes how to configure IP parameters for devices running Layer 3 software.

Configuring IP addresses

You can configure an IP address on the following types of Layer 3 switch interfaces:

- Ethernet port
- Virtual routing interface (also called a Virtual Ethernet or "VE")
- Loopback interface

By default, you can have up to 24 IP addresses on each interface, but you can increase this number to 128 IP addresses.

NOTE
Once you configure a virtual routing interface on a VLAN, you cannot configure Layer 3 interface parameters on individual ports in the VLAN. Instead, you must configure the parameters on the virtual routing interface itself.

Brocade devices support both classical IP network masks (Class A, B, and C subnet masks, and so on) and Classless Interdomain Routing (CIDR) network prefix masks.

- To enter a classical network mask, enter the mask in IP address format. For example, enter "209.157.22.99 255.255.255.0" for an IP address with a Class-C subnet mask.
- To enter a prefix network mask, enter a forward slash (/) and the number of bits in the mask immediately after the IP address. For example, enter "209.157.22.99/24" for an IP address that has a network mask with 24 significant bits (ones).

By default, the CLI displays network masks in classical IP address format (for example: 255.255.255.0). You can change the display to prefix format.

Assigning an IP address to an Ethernet port

Enter the following commands to assign an IP address to port 1/1/1.

```
Brocade(config)# interface ethernet 1/1/1
Brocade(config-if-1/1/1)# ip address 192.45.6.1 255.255.255.0
```

NOTE
You also can enter the IP address and mask in CIDR format, as follows:

```
Brocade(config-if-1/1/1)# ip address 192.45.6.1/24
```

Syntax: [**no**] **ip address** <*ip-addr*> <*ip-mask*>

or

Syntax: [**no**] **ip address** <*ip-addr*>/<*mask-bits*>

Assigning an IP address to a loopback interface

Loopback interfaces are always up, regardless of the states of physical interfaces. They can add stability to the network because they are not subject to route flap problems that can occur due to unstable links between a Layer 3 Switch and other devices. You can configure up to four loopback interfaces on a Layer 3 switch.

You can add up to 24 IP addresses to each loopback interface.

NOTE
If you configure the Brocade switch to use a loopback interface to communicate with a BGP4 neighbor, you must also configure a loopback interface on the neighbor and configure the neighbor to use that loopback interface to communicate with theBrocade switch.

To add a loopback interface, enter commands such as those shown in the following example:

```
Brocade(config)# exit
Brocade(config)# int loopback 1
Brocade(config-lbif-1)# ip address 10.0.0.1/24
```

Syntax: interface loopback <*num*>

The <num> parameter specifies the virtual interface number. You can specify from 1 to the maximum number of virtual interfaces supported on the device. To display the maximum number of virtual interfaces supported on the device, enter the **show default values** command. The maximum is listed in the System Parameters section, in the Current column of the virtual-interface row.

Assigning an IP address to a virtual routing interface

A virtual interface is a logical port associated with a Layer 3 Virtual LAN (VLAN) configured on a Layer 3 switch. You can configure routing parameters on the virtual interface to enable the Layer 3 switch to route protocol traffic from one Layer 3 VLAN to the other, without using an external router.

This section describes how to configure an IP address on a virtual interface.

NOTE
The switch uses the lowest MAC address on the device (the MAC address of port 1 or 1/1/1) as the MAC address for all ports within all virtual interfaces you configure on the device.

Enter commands similar to the following to add a virtual interface to a VLAN and configure an IP address on the interface.

```
Brocade(config)# vlan 2 name IP-Subnet_1.1.2.1/24
Brocade(config-vlan-2)# untag 1/1/1 to 1/1/4
Brocade(config-vlan-2)# router-interface ve1
Brocade(config-vlan-2)# interface ve1
Brocade(config-vif-1)# ip address 1.1.2.1/24
```

The first two commands in this example create a Layer 3 protocol-based VLAN name "IP-Subnet_1.1.2.1/24" and add a range of untagged ports to the VLAN. The **router-interface** command creates virtual interface 1 as the routing interface for the VLAN. The last two commands change to the interface configuration level for the virtual interface and assign an IP address to the interface.

Syntax: router-interface ve <*num*>

Syntax: interface ve <*num*>

Deleting an IP address

Enter a command similar to the following to delete an IP address.

```
Brocade(config-if-1/1/1)# no ip address 1.1.2.1
```

This command deletes IP address 1.1.2.1. You do not need to enter the subnet mask.

To delete all IP addresses from an interface, enter the following command:

```
Brocade(config-if-1/1/1)# no ip address *
```

Syntax: no ip address <*ip-addr*> | *

Connecting network devices

Brocade devices support connections to other vendors' routers, switches, and hubs, as well other Brocade devices.

Connectors.

For port pinouts, refer to "Pinouts and signalling" on page 63.

Cable specifications

Refer to "Cable specifications" on page 64 for cable lengths and types.

Connecting to Ethernet or fast Ethernet hubs

For copper connections to Ethernet hubs, a 10/100BaseTX or 1000BaseT switch, or another Brocade device, a crossover cable is required (Figure 37 and Figure 38). If the hub is equipped with an uplink port, it will require a straight-through cable instead of a crossover cable.

NOTE
The 802.3ab standard (automatic MDI or MDIX detection) calls for automatic negotiation of the connection between two 1000Base-T ports. In this case a straight-through cable may work just as well as a crossover cable. For more information about this feature, see the *FastIron Configuration Guide*.

FIGURE 37 UTP crossover cable

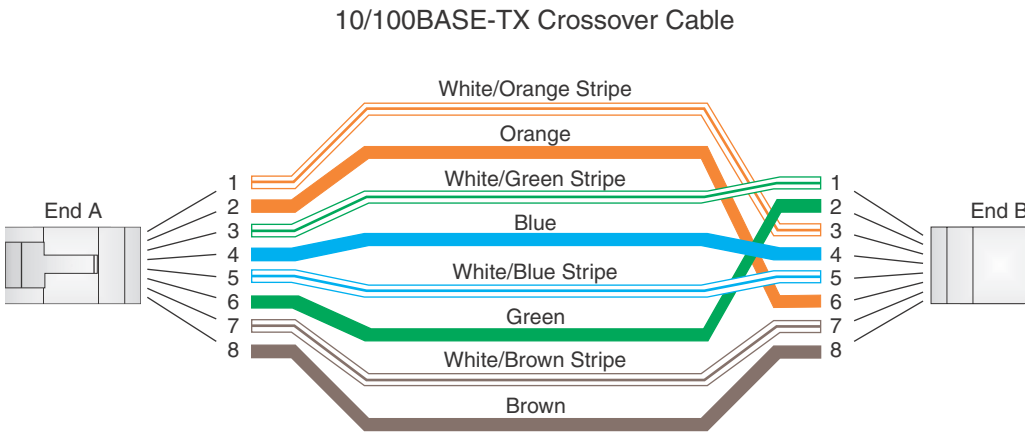
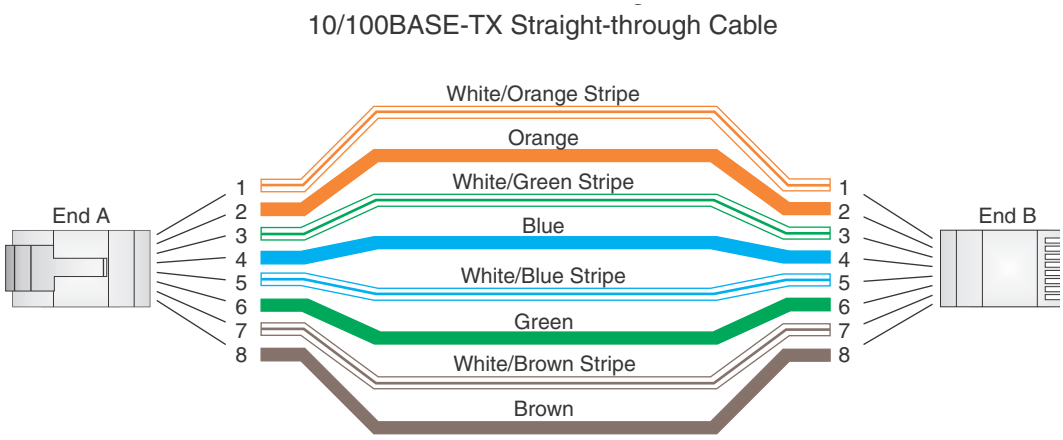


FIGURE 38 Straight-through cable



Connecting to workstations, servers, or routers

Straight-through UTP cabling is required for direct UTP attachment to workstations, servers, or routers using network interface cards (NICs).

Fiber cabling is required for direct attachment to Gigabit NICs or switches and routers through fiber ports. Refer to "Connecting a network device to a fiber port" on page 42.

Automatic MDI or MDIX detection

All 10/100 and Gbps Ethernet Copper ports on the devices support automatic Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDIX) detection. This feature is enabled on all 10/100 and Gigabit copper ports by default. For each port, you can disable auto MDI or MDIX, designate the port as an MDI port, or designate the port as an MDIX port.

For more information about this feature and how configure it, refer to *FastIron Configuration Guide*.

Connecting a network device to a fiber port

For direct attachment from the device to a Gbps NIC, switch, or router, using a fiber optic transceiver, you will need fiber cabling with an LC connector.

To connect the device to another network device using a fiber port, you must do the following tasks:

- Install a fiber optic transceiver (XFP, SFP, or SFP+)
- Cable the fiber optic transceiver

The following sections describe these tasks.

Fiber Optic transceivers

Table 17 lists supported XFP transceivers (for stacking and non-stacking FCX models). Table 18 shows supported SFP and SFP+ transceivers. For information about cabling for transceivers, see Table 24.

TABLE 17 Supported XFP transceivers for Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX648S-F, Brocade FCX 624S-HPOE, Brocade FCX 648S-HPOE

10 Gigabit Optic	Distance	Supported for stacking
10GBase-SR	300m	Yes
10GBase-LR	10km	No
10GBase-ER	40km	No
10GBase-LRM (1310-MMF)	200m	No
10G-ZR	80km	No
10GBase-ZRD	80km	No

TABLE 18 Supported SFP transceivers for Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, Brocade FCX 648-I

10 Gigabit Optic	Distance	Supported for stacking
10GSFPP-SR	300m	Yes
10GSFPP-LR	10km	No

Installing a transceiver

You can install a new transceiver in an XFP, SFP, or SFP+ slot while the device is powered on and running.

While installing a transceiver, wear an ESD wrist strap with a plug for connection to a metal surface.

NOTE
For safety reasons, the ESD wrist strap should contain a series 1 meg ohm resistor.

CAUTION
All fiber optic interfaces use Class 1 lasers.

Use the following setps to install a transceiver.

1. Put on the ESD wrist strap and ground yourself by attaching the clip end to a metal surface (such as an equipment rack) to act as ground.
2. Remove the new transceiver from the protective packaging.
3. Gently insert the transceiver into the slot until it clicks into place. Transceivers are keyed to prevent incorrect insertion.

FIGURE 39 Installing a transceiver in Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, FCX648-HPOE devices

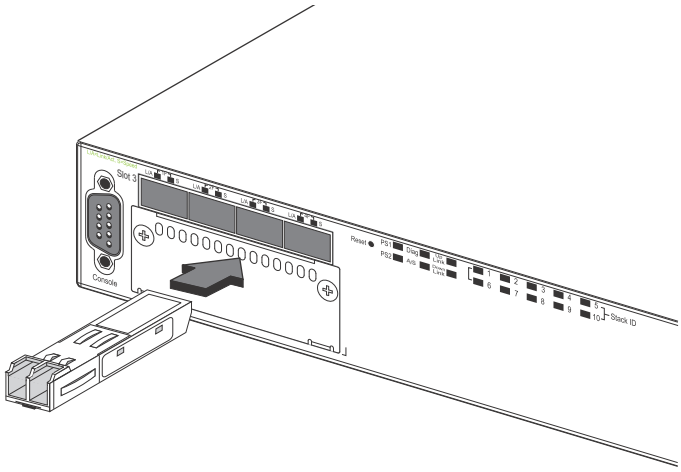
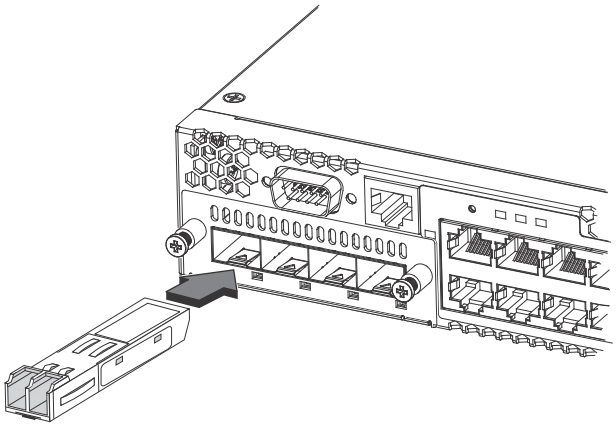


FIGURE 40 Installing a transceiver in Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, Brocade FCX 648-I devices



Cabling a fiber optic transceiver

Use the following steps to cable a fiber optic transceiver.

1. Remove the protective covering from the fiber-optic port connectors and store the covering for future use.
2. Before cabling a fiber optic transceiver, Brocade strongly recommends cleaning the cable connectors and the port connectors. For more information, refer to "Cleaning the fiber optic connectors" on page 45.
3. Gently insert the cable connector (a tab on each connector should face upward) into the transceiver connector until the tabs lock into place.
4. Observe the link and active LEDs to determine if the network connections are functioning properly. For more information about the LED indicators, refer to Table 19.

Cleaning the fiber optic connectors

To avoid problems with the connection between the fiber optic transceiver (SFP, SFP+, or mini-GBIC) and the fiber cable connectors, Brocade strongly recommends cleaning both connectors each time you disconnect and reconnect them. Dust can accumulate in the connectors and cause problems such as reducing the optic launch power.

To clean the fiber cable connectors, Brocade recommends using a fiber optic reel-type cleaner. You can purchase this type of cleaner from the following Website:

http://www.fisfiber.com/Home_Page.asp

When not using an SFP connector, make sure to keep the protective covering in place.

Testing connectivity

Test for connectivity by observing the LEDs related to network connection.

Pinging an IP address

To verify that a FastIron CX device can reach another device through the network, enter a command similar to the following at any level of the CLI.

```
Brocade> ping 192.33.4.7
```

Syntax: **ping** <*ip addr*> [**source** <*ip addr*>] [**count** <*num*>] [**timeout** <*msec*>] [**ttl** <*num*>] [**verify**] [**no-fragment**] [**quiet**] [**data** <*1-to-4 byte hex#, e.g. abcdef00*>] [**numeric**] [**size** <*byte*>] [**brief** [**max-print-per-sec** <*num 0-2047*>]]

NOTE
If you address the ping to the IP broadcast address, the device lists the first four responses.

Observing LEDs

After you install the network cables, you can observe certain LEDs to determine if the network connections are functioning properly. Table 19 outlines the LEDs related to the network connections, the desired state of each LED, possible abnormal states of each LED, and what to do if an LED indicates an abnormal state.

TABLE 19 Network connection-related LED states

LED	Desired State	Meaning	Abnormal State	Meaning or Action
Ethernet (1-24/48) Link or Activity or Speed	On or Blinking (Green or Amber)	A link is established with the remote port and user packets are being transmitted or received.	Off	A link is not established with the remote port. You can do the following: • Verify that the connection to the other network device has been properly made. Also, make certain that the other network device is powered on and operating correctly. • Verify that the port has not been disabled through a configuration change. You can use the CLI. If you have configured an IP address on the device, you also can use the Web management interface or IronView Network Manager. • For the combination ports (ports 1~4), check that the shared SFP port (1F~4F) is not being used. • If the other actions don't resolve the problem, try using a different port or a different cable.
HPOE (1-24/48) **Note:** FCX-E and FCX-I devices do not support HPOE	On Green	The port is providing HPOE power.	Off	A link is not established with the HPOE device. You can do the following: • Verify that the connection to the other network device has been properly made. • If the other actions don't resolve the problem, try using a different port or a different cable.
SFP (1F~4F) Link or Activity	On Green	A link is established with the remote port.	Off	A link is not established with the remote port. You can do the following: • Verify that the connection to the other network device has been properly made. Also, make certain that the other network device is powered on and operating correctly. • Verify that the transmit port on the Brocade device is connected to the receive port on the other network device, and that the receive port on the Brocade device is connected to the transmit port on the other network device. If you are not certain, remove the two cable connectors from the port connector and reinsert them in the port connector, reversing their order. • Dust may have accumulated in the cable connector or port connector. For information about cleaning the connectors, refer to "Cleaning the fiber optic connectors" on page 45. • Verify that the port has not been disabled through a configuration change. • Check that the configuration has not forced the use of the RJ45 port shared with the SFP port. • If the other actions don't resolve the problem, try using a different port or a different cable.
SFP (1F~4F) Speed	On (Green or Amber)	A link is established with the remote port.	Off	A link is not established with the remote port. You can do the following: • Check the Link LED to make sure the link is still established with the remote port. If not, take the actions described in the Meaning or Action column for the Link LED.

TABLE 19 Network connection-related LED states (Continued)

LED	Desired State	Meaning	Abnormal State	Meaning or Action
SFP+ (1F~4F) Link or Activity	On Green	A link is established with the remote port.	Off	A link is not established with the remote port. You can do the following: • Verify that the connection to the other network device has been properly made. Also, make certain that the other network device is powered on and operating correctly. • Verify that the transmit port on the Brocade device is connected to the receive port on the other network device, and that the receive port on the Brocade device is connected to the transmit port on the other network device. If you are not certain, remove the two cable connectors from the port connector and reinsert them in the port connector, reversing their order. • Dust may have accumulated in the cable connector or port connector. For information about cleaning the connectors, refer to "Cleaning the fiber optic connectors" on page 45. • Verify that the port has not been disabled through a configuration change. • Check that the configuration has not forced the use of the RJ45 port shared with the SFP port. • If the other actions don't resolve the problem, try using a different port or a different cable.
SFP+ (1F~4F) Speed	On (Green or Amber)	A link is established with the remote port.	Off	A link is not established with the remote port. You can do the following: • Check the Link LED to make sure the link is still established with the remote port. If not, take the actions described in the Meaning or Action column for the Link LED.

If a problem persists after taking these actions, contact Brocade Technical Support.

Tracing a route

To determine the path through which a Brocade device can reach another device, enter a command similar to the following at any level of the CLI on the device.

```
Brocade> traceroute 192.33.4.7
```

Syntax: **traceroute** <*host-ip-addr*> [**maxttl** <*value*>] [**minttl** <*value*>] [**numeric**] [**timeout** <*value*>] [**source-ip** <*ip addr*>]

The CLI displays trace route information for each hop as soon as the information is received. Traceroute requests display all responses to a given TTL. In addition, if there are multiple equal-cost routes to the destination, the Brocade device displays up to two responses by default.

Troubleshooting network connections

- For the indicated port, verify that both ends of the cabling (at the device and the connected device) are snug.
- Verify that the device and the connected device are both powered on and operating correctly.

- Verify that you have used the correct cable type for the connection:
  - For twisted-pair connections to an end node, use straight-through cabling.
  - For fiber optic connections, verify that the transmit port on the device is connected to the receive port on the connected device, and that the receive port on the device is connected to the transmit port on the connected device.
- Use the CLI to verify that the port has not been disabled through a configuration change. If you have configured an IP address on the device, you also can use the Web management interface or IronView Network Manager.
- If the other procedures don't resolve the problem, try using a different port or a different cable.

Using Virtual Cable Testing to diagnose a cable

These devices support Virtual Cable Test (VCT) technology. VCT technology enables you to diagnose a conductor (wire or cable) by sending a pulsed signal into the conductor, then examining the reflection of that pulse. This method of cable analysis is referred to as Time Domain Reflectometry (TDR). By examining the reflection, the device can detect and report cable statistics such as local and remote link pair, cable length, and link status.

Configuration notes

- This feature is supported on copper ports only. It is not supported on fiber ports.
- The port to which the cable is connected must be enabled when you issue the command to diagnose the cable. If the port is disabled, the command is rejected.
- If the port is operating at 100 Mbps half-duplex, the TDR test on one pair will fail.
- If the remote pair is set to forced 100 Mbps, any change in MDI or MDIX may cause the device to interpret the Multilevel Threshold-3 (MLT-3) as a reflected pulse, in which case, the device will report a faulty condition. In this case, Brocade recommends that you run the TDR test a few times for accurate results.

Command syntax

To diagnose a cable using TDR, enter a command such as the following at the Privileged EXEC level of the CLI.

```
Brocade# phy cable-diag tdr 1/1/1
```

This command diagnoses the cable attached to port 1/1/1.

Syntax: phy cable-diag tdr <*port-num*>

Viewing the results of the cable analysis

To display the results of the cable analysis, enter a command similar to the following at the Privileged EXEC level of the CLI.

```
Brocade# show cable-diag tdr 1/1/1
```

The output from this command appears below.

```
Brocade# show cable-diag tdr 1/1/1
Port      Speed Local pair Pair Length Remote pair Pair status
--------- ----- ---------- ----------- ----------- -----------
1/1/1     1000M Pair A     <50M        Pair B      Terminated
                Pair B     <50M        Pair A      Terminated
                Pair C     <50M        Pair D      Terminated
                Pair D     <50M        Pair C      Terminated
```

Syntax: show cable-diag tdr <*port-num*>

Table 20 defines the fields shown in this output.

TABLE 20 Cable statistics

This Line...	Displays...
Port	The port that was tested.
Speed	The current line speed of the port.
Local pair	The local link name.
Pair Length	The cable length when terminated, or the distance to the point of fault when the line is not up.
Remote pair	The remote link name.
Pair status	The status of the link. This field displays one of the following: • Terminated: The link is up. • Shorted: A short is detected in the cable. • Open: An opening is detected in the cable. • ImpedMis: The impedance is mismatched. • Failed: The TDR test failed.

Digital optical monitoring

You can configure your device to monitor optical transceivers in the system, either globally or by specified port. When this feature is enabled, the system monitors the temperature and signal power levels for the optical transceivers in the specified ports. Console messages and syslog messages are sent when optical operating conditions fall below or rise above the XFP, SFP, and SFP+ manufacturer's recommended thresholds. For more information about digital optical monitoring, refer to *FastIron Configuration Guide*.

Chapter

Managing the FastIron CX Hardware

4

CAUTION

The procedures in this manual are for qualified service personnel.

Managing temperature settings

This section describes how to display temperature settings on the device and how to change the temperature warning and shutdown levels.

Using the temperature sensor

The device ships with three built-in temperature sensors that cause the device to generate a Syslog message and SNMP trap if the temperature exceeds a specified warning level or shutdown level. If the device temperature exceeds the safe threshold (shutdown level), the device will reboot.

The software reads the temperature sensors based on the device poll time, which is by default 60 seconds. If the temperature equals or exceeds the shutdown temperature for five consecutive polls by the software, the software will reboot the device to prevent damage.

You can use the CLI or Web management interface to perform the following tasks:

- Display the temperature of the device
- Change the warning and shutdown temperature levels
- Change the device poll time

Displaying the temperature

By default, the software polls the temperature sensor every 60 seconds to get the current temperature. This poll rate is controlled by the device poll time, which also controls how often the software polls other system components.

To display the temperature of a device, enter the **show chassis** command at any level of the CLI.

```
Brocade# show chassis
The stack unit 1 chassis info:
Power supply 1 (NA - AC - Regular) present, status ok
Power supply 2 not present
Fan ok, speed (auto): [[1]]<->2<->3
Fan speed switching temperature thresholds:
        1 -> 2 @ 61 deg-C
        1 <- 2 @ 56 deg-C
        2 -> 3 @ 67 deg-C
        2 <- 3 @ 62 deg-C
MAC 1 Temperature Readings:
        Current temperature : 50.5 deg-C
```

```
        Warning level.......: 80.0 deg-C
        Shutdown level......: 90.0 deg-C
CPU Temperature Readings:
        Current temperature : 49.0 deg-C
Boot Prom MAC : 0012.f2d4.69c0
Management MAC: 0012.f2d4.69c0
```

Syntax: show chassis

Displaying Syslog messages for temperature

The software sends a Syslog message and an SNMP trap if the temperature crosses the warning or shutdown thresholds. The following methods describe how to view the system log on the device. If you have configured the device to use a Syslog server or SNMP trap receiver, see the documentation for the server or receiver.

To display the system log, enter the **show log** command at any CLI level.

```
Brocade# show log
Syslog logging: enabled (0 messages dropped, 0 flushes, 0 overruns)
Buffer logging: level ACDMEINW, 8 messages logged
level code: A=alert C=critical D=debugging M=emergency E=error
I=informational N=notification W=warning

Static Log Buffer:

Dynamic Log Buffer (50 entries):

at 0 days 0 hours 2 minutes 0 seconds, level alert
Temperature 48.0 C degrees, warning level 45.0 C degrees, shutdown level 55.0 C
degrees

at 0 days 0 hours 1 minutes 0 seconds, level alert
Temperature 40.0 C degrees, warning level 35.0 C degrees, shutdown level 45.0 C
degrees
```

Changing temperature warning and shutdown levels

The default warning temperatures and the default shutdown temperatures for the device are:

- Warning temperature is 85 Deg-C (measured on mainboard)
- Shutdown temperature is 90 Deg-C (measured on mainboard)

NOTE
These temperatures reflect the temperature of the board inside the device.

To change the temperature at which the device sends a warning, enter a command similar to the following at the Privileged EXEC level of the CLI:

```
Brocade# temperature warning 1 85
```

Syntax: temperature warning <*stack-unit*> <*value*>

The <*stack-id*> can be 1 – 8.

The <*value*> can be 0 – 125

```
Brocade# temperature
  temperature         temperature sensor commands
```

```
Brocade# temperature warning
  warning   Temperature at which the module sends a warning
Brocade# temperature warning
  DECIMAL   Stack Number
Brocade# temperature warning 1 87
Brocade# show chassis
The stack unit 1 chassis info:
Power supply 1 (NA - AC - Regular) present, status ok
Power supply 2 not present
Fan ok, speed (auto): [[1]]<->2<->3
Fan speed switching temperature thresholds:
        1 -> 2 @ 61 deg-C
        1 <- 2 @ 56 deg-C
        2 -> 3 @ 67 deg-C
        2 <- 3 @ 62 deg-C
MAC 1 Temperature Readings:
        Current temperature : 51.5 deg-C
        Warning level.......: 87.0 deg-C
        Shutdown level......: 90.0 deg-C
CPU Temperature Readings:
        Current temperature : 51.0 deg-C
Boot Prom MAC : 0012.f2d4.69c0
Management MAC: 0012.f2d4.69c0
```

Changing the shutdown temperature

You can change the shutdown temperature using the **fan-threshold** command as shown. The valid range is 0-125 deg-C.

```
Brocade(config)# stack unit 1
Brocade(config-unit-1)# fan-threshold mp speed-3 62 95
Brocade(config-unit-1)# show chassis
The stack unit 1 chassis info:
Power supply 1 (NA - AC - Regular) present, status ok
Power supply 2 not present
Fan ok, speed (auto): [[1]]<->2<->3
Fan speed switching temperature thresholds:
        1 -> 2 @ 61 deg-C
        1 <- 2 @ 56 deg-C
        2 -> 3 @ 67 deg-C
        2 <- 3 @ 62 deg-C
MAC 1 Temperature Readings:
        Current temperature : 56.5 deg-C
        Warning level.......: 85.0 deg-C
        Shutdown level......: 95.0 deg-C
CPU Temperature Readings:
        Current temperature : 53.0 deg-C
Boot Prom MAC : 0012.f2d4.69c0
Management MAC: 0012.f2d4.69c0
Brocade(config-unit-1)#
```

Syntax: fan-threshold speed-3 mp <*lowest value*> <*highest value*>

The device will automatically reset and reload the software when the internal temperature reaches or exceeds the configured shutdown level for five minutes. The system is also capable of registering negative temperature settings.

To change the temperature at which the FastIron CX sends a warning, you must change the fan speed threshold. To view the current temperature thresholds, enter the **show chassis** command:

```
Brocade# show chassis
The stack unit 1 chassis info:
Power supply 1 (NA-AC-Regular)present, status ok
Power supply 2 not present
Fan ok, speed (auto): 1<->[[2]]<->3
Fan ok, speed (auto): 1<->[[2]]<->3
Fan speed switching temperature thresholds:
        1 -> 2 @ 53 deg-C
        1 <- 2 @ 37 deg-C
        2 -> 3 @ 55 deg-C
        2 <- 3 @ 50 deg-C
MAC 1 Temperature Readings:
        Current temperature : 53.0 deg-C
MAC 2 Temperature Readings:
        Current temperature : 53.0 deg-C
Temperature Readings:
        Current temperature : 53.0 deg-C
        Warning level.......: 60.0 deg-C
        Shutdown level......: 80.0 deg-C
CPU Temperature Readings:
        Current temperature : 47.5 deg-C
```

Enter a command to the following to change the temperature shutdown level from 80 deg-C to 90 deg-C.

```
Brocade#stack unit 1
Brocade(config-unit-1)#fan-threshold mp speed-3 50 90
```

Syntax: fan-threshold speed-3 mp <*lowest value*> <*highest value*>

The <value> can be 0 – 125.

Enter the show chassis command to confirm the change:

```
Brocade# show chassis
The stack unit 1 chassis info:
Power supply 1 (NA-AC-Regular)present, status ok
Power supply 2 not present
Fan ok, speed (auto): 1<->[[2]]<->3
Fan ok, speed (auto): 1<->[[2]]<->3
Fan speed switching temperature thresholds:
        1 -> 2 @ 53 deg-C
        1 <- 2 @ 37 deg-C
        2 -> 3 @ 55 deg-C
        2 <- 3 @ 50 deg-C
MAC 1 Temperature Readings:
        Current temperature : 53.0 deg-C
MAC 2 Temperature Readings:
        Current temperature : 53.0 deg-C
Temperature Readings:
        Current temperature : 53.0 deg-C
        Warning level.......: 60.0 deg-C
        Shutdown level......: 90.0 deg-C
CPU Temperature Readings:
        Current temperature : 47.5 deg-C
```

Changing the temperature polling interval

The software reads the temperature sensor and polls other hardware sensors according to the value set for the poll time, which is 60 seconds by default. You can change the poll time using the CLI.

To change the poll time, enter a command similar to the following at the global CONFIG level:

```
Brocade(config)# chassis poll-time 200
```

Syntax: chassis poll-time <*value*>

The <*value*> parameter is in seconds. It can be 0 – 65535.

Removing MAC address entries

You can remove the following types of learned MAC address entries from the system MAC address table:

- All MAC address entries
- All MAC address entries for a specified Ethernet port
- All MAC address entries for a specified VLAN
- A specified MAC address entry in all VLANs

For example, to remove entries for the MAC address 000d.cb80.00d in all VLANs, enter the following command at the Privileged EXEC level of the CLI:

```
Brocade# clear mac-address 000d.cb80.00d0
```

Syntax: clear mac-address <*mac-address*> | **ethernet** <*port-num*> | **vlan** <*number*>

If you enter the **clear mac-address** command without any parameters, the software removes all MAC entries.

Use the <*mac-address*> parameter to remove a specified MAC address from all VLANs. Specify the MAC address in the following format: HHHH.HHHH.HHHH.

Use the **ethernet** <*port-num*> parameter to remove all MAC addresses for a specified Ethernet port.

Use the **vlan** <*number*> parameter to remove all MAC addresses for a specified VLAN.

Displaying FastIron CX CPU usage

You can display the amount of the FastIron CX CPU in use. To do so, enter the **show cpu** command at any level of the CLI:

```
Brocade# show cpu
31 percent busy, from 3248 sec ago
1   sec avg:  10 percent busy
5   sec avg:  10 percent busy
60  sec avg:  10 percent busy
300 sec avg:  10 percent busy
```

Syntax: show cpu

Hardware maintenance schedule

FastIron CX switch hardware components require minimal maintenance. Brocade recommends cleaning the fiber-optic connectors on a fiber-optic port and the connected fiber cable each time you disconnect the cable.

You can replace the copper and fiber optic modules (SFPs or mini-GBICs).

Replacing a copper or fiber optic module

You can remove an SFP from a slot and replace it with a new one while the FastIron CX is powered on and running.

This section provides information about the following tasks:

- Removing a copper or fiber optic module
- Installing a new copper or fiber optic module
- Cabling a fiber optic module

Removing a copper or fiber optic module

You can remove a copper or fiber SFP (also called a mini-GBIC) from a slot while the FastIron CX is powered on and running.

While removing a copper or fiber optic module, be sure to wear an ESD wrist strap with a plug for connection to the ESD connector on the FastIron CX.

CAUTION

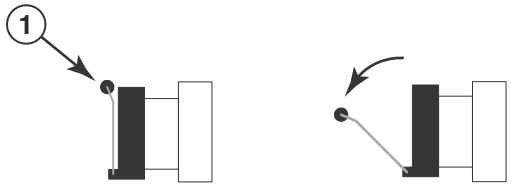
For safety reasons, the ESD wrist strap should contain a series 1 meg ohm resistor.

To remove a copper or fiber optic module from an SFP slot, do the following.

1. Put on the ESD wrist strap and ground yourself by attaching the clip end to a metal surface (such as an equipment rack).
2. Disconnect the copper or fiber cable connector from the port connector.
3. Unlock the copper or fiber optic module by pulling the bail latch forward, away from the front panel of the module.

   On 1000BaseSX ports, the bail latch is enclosed in a black sleeve, and on 1000BaseLX ports, the bail latch is enclosed in a blue sleeve.

FIGURE 41 Unlocking the bail latch



1 Bail Latch

FIGURE 42 Removing the bail latch

NOTE
The bail latch may be attached to either the top or the bottom of the mini-GBIC.

4. Grasp the bail latch and pull the copper or fiber optic module out of the port.

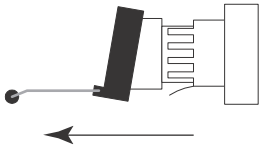


FIGURE 43 Remove fiber optic module

5. Store the copper or fiber optic module in a safe, static-free place or in an anti-static bag.
6. Install a new copper or fiber optic module in the port.

Cabling a fiber optic module

For instructions on cabling a fiber optic module refer to “Cabling a fiber optic transceiver” on page 44.

Cleaning the fiber optic connectors

For instructions on cleaning a fiber optic module refer to “Cleaning the fiber optic connectors” on page 45.

4 Replacing a copper or fiber optic module

Chapter

5

Hardware Specifications

Hardware specifications

This chapter provides the hardware specifications for FastIron CX devices.

Physical dimensions and weight

Table 21 lists the physical dimensions and weight for the FastIron CX devices.

TABLE 21 Physical dimensions and weight

Model	Height	Width	Depth	Weight
Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F	4.4 cm 1.7 in	44 cm 17.32 in	38.6 cm 15.19 in	4 kg (8.8 lbs)
Brocade FCX 624S-HPOE, Brocade FCX 648S-HPOE	4.4 cm 1.7 in	44 cm 17.32 in	44 cm 17.32 in	4.5 kg (9.9 lbs)
Brocade FCX 624-E Brocade FCX 624-I	4.4 cm 1.7 in	44 cm 17.32 in	43.5 cm 17.13 in	5.35 kg (11.79 lbs)
Brocade FCX 648-E Brocade FCX 648-I	4.4 cm 1.7 in	44 cm 17.32 in	43.5 cm 17.13 in	5.71 kg (12.59 lbs)

Environmental considerations

For optimal performance, operate or store your device in compliance with the following environmental conditions.

Operating Environment

Table 22 provides the operating environment specifications.

TABLE 22 Operating environment

Operating Temperature	Relative Humidity	Operating Altitude
0° – 40° C (32° – 104° F)	5 to 95%, @ 40° C (104.9°F), non-condensing	0 – 3000 meters (10,000 feet)

Storage environment

Table 23 provides the storage environment specifications.

TABLE 23 Storage environment specifications

Storage Temperature	Storage Humidity	Storage Altitude
40× to 70× C (-40× to 158× F)	95% maximum, non-condensing	3,000 meter (10,000 feet) maximum

Cooling system and fans

The fans cool the CPU, main memory, and voltage regulators. For the Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, and FCX648-HPOE switches, the fans use either a push or pull configuration to move the air from the right side of the device to the left side of the device.

- Total cooling capacity: 80 to 130 watts
- Total air flow: 34.3 CFM
- Operating noise: ideal 51 dB-A

For the Brocade FCX 624-E and Brocade FCX 648-E models, the air flows from the front to the rear of the device. For the Brocade FCX 624-I and Brocade FCX 648-I models, the air flows from the rear to the front of the device.

- Total cooling capacity: 180 Watts
- Total air flow: 85.2 CFM
- Operating noise: ideal 60 dB-A

NOTE
Operating noise is based on the ISO 7779 standard.

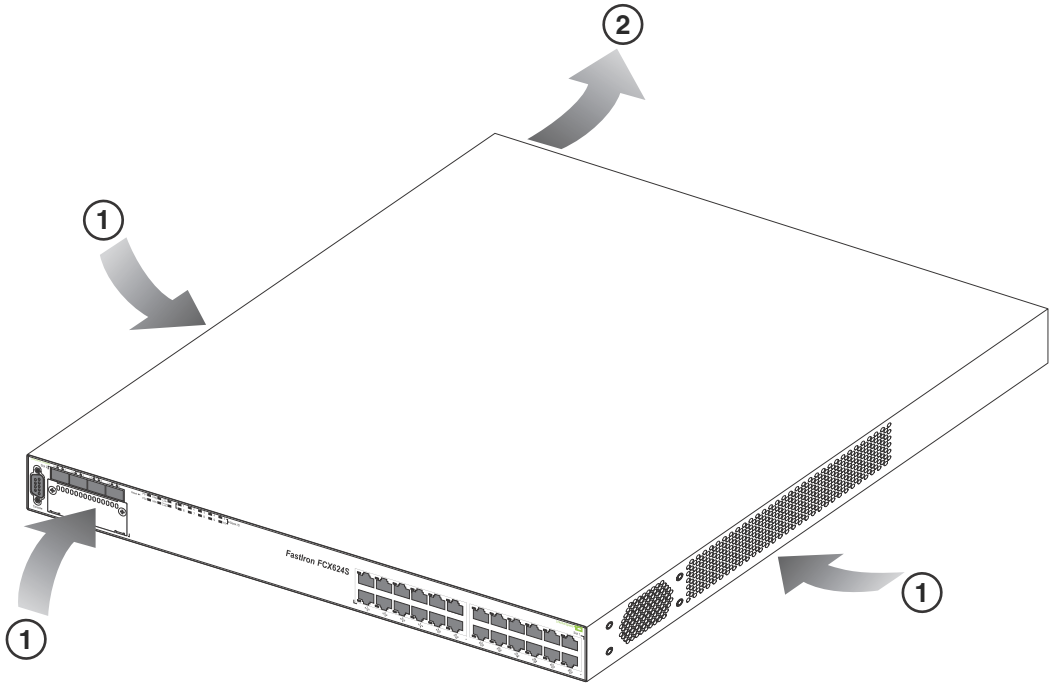
Figure 44 shows the airflow for the Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, and FCX648-HPOE models. Figure 45 shows airflow for Brocade FCX 624-E devices and Figure 46 shows airflow for Brocade FCX 624-I devices.

CAUTION

For the Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, and Brocade FCX 648-I devices, be sure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I" as shown in Table 1 on page 5.

For an illustration of the fan tray labels, see "Power supply and fan tray labels for Brocade FCX 624-E, Brocade FCX 624-I, Brocade FCX 648-E, and Brocade FCX 648-I devices" on page 5.

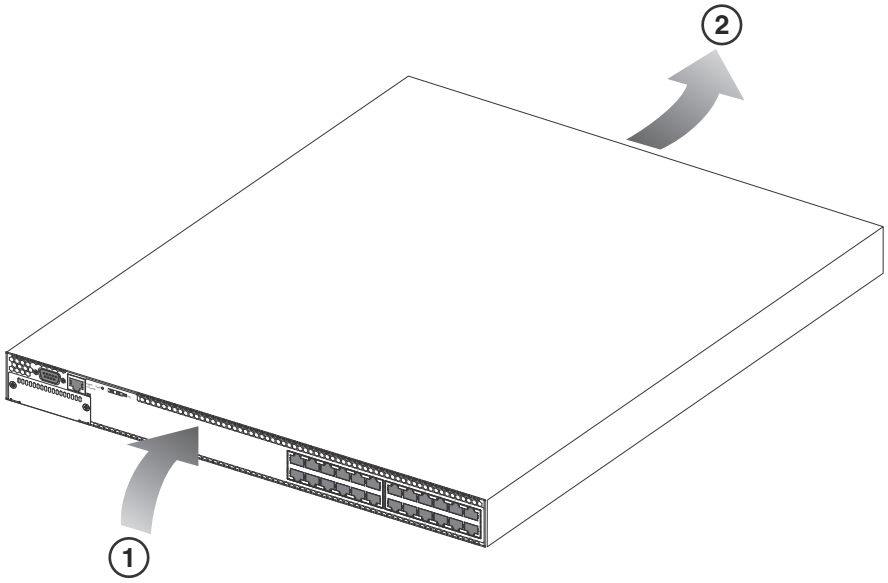
FIGURE 44 Brocade FCX 624S, Brocade FCX 648S, Brocade FCX 624S-F, FCX624-HPOE, and FCX648-HPOE device airflow



1 Air Inflow

2 Air outlet

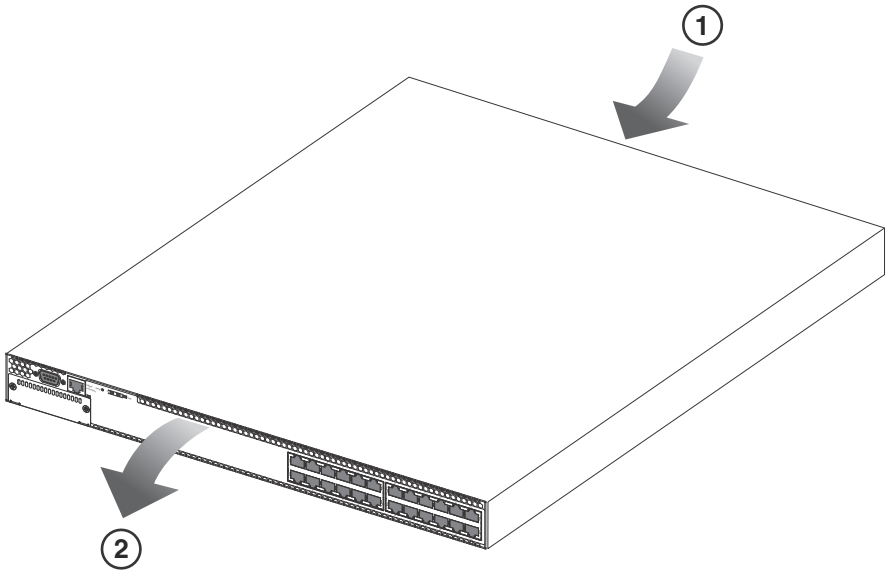
FIGURE 45 Brocade FCX 624-E and Brocade FCX 648-E device airflow



1 Air Inflow

2 Air outlet

FIGURE 46 Brocade FCX 624-I and Brocade FCX 648-I device airflow



1 Air Inflow

2 Air outlet

For a complete list of regulatory compliances refer to "Regulatory compliance" on page 72.

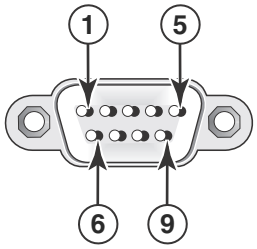
Pinouts and signalling

This section describes the pinout diagrams for the DB-9 connector and RJ45 port jacks.

Serial (Console) port pinouts

The Console port is a standard male DB-9 connector, as shown in Figure 47.

FIGURE 47 Serial port pinouts



Most PC serial ports require a cable with a female DB-9 connector. However, terminal connections will vary, requiring a cable with either a DB-9 or DB-25 connector, male or female.

Serial cable options between the FastIron CX switch and a PC or terminal are shown in Figure 48.

NOTE
As indicated in Figure 48 and Figure 49, some of the wires should not be connected. If you do connect the wires that are labeled “Reserved”, you may get unexpected results with some terminals.

FIGURE 48 Console port pin assignments showing cable connection options to a terminal or PC

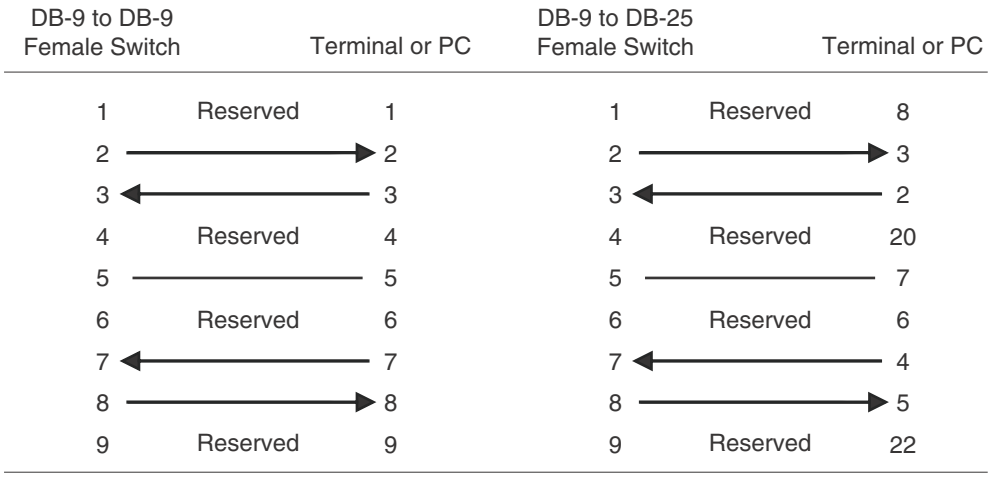
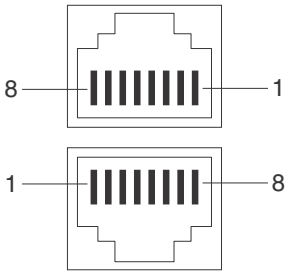


FIGURE 49 Pin assignment and signalling for 10/100BaseTX and 1000BaseT ports



Pin Assignment	10BaseT Pin Number	10BaseT MDI-X ports	100BaseTX and 1000BaseT Pin Number	100BaseTX and 1000BaseT MDI-X ports
	1	RD+	1	RD+
	2	RD-	2	RD-
	3	TD+	3	TD+
	4	Not used	4	CMT
	5	Not used	5	CMT
	6	TD-	6	TD-
	7	Not used	7	CMT
	8	Not used	8	CMT

Cable specifications

Table 24 lists the specifications for the cables used with the 10/100 Ethernet ports. For information about supported transceivers, see Table 17 and Table 18.

NOTE
Cable installation and network configuration will affect overall transmission capability. The numbers provided below represent the accepted recommendations of the various standards. For network-specific recommendations, consult your local Brocade reseller or system engineer.

TABLE 24 Cable length summary

	Cable Type	Connector Type	Core Diameter (microns)	Modal Bandwidth (MHz*km) or Wavelength (nm)	Range (meters)
1000Base-BX-D	Single-mode Fiber (SMF)	LC connector for SFP module	9	1490 nm	2 – 10000 (10km)
1000Base-BX-U	SMF	LC connector for SFP module	9	1310 nm	2 – 10000 (10km)
1000Base-LHA	SMF	LC connector for SFP module	9	1550 nm	2 – 70000 (70km)
1000Base-LHB	SMF	LC connector for SFP module	9	1550 nm	2 – 120000 (120km)
1000Base-LX	Multi-mode Fiber (MMF)	LC connector for SFP module	62.5	500	2 – 550
	MMF		50	400	2 – 550
	MMF		50	500	2 – 550
	SMF		9	1300 nm	2 – 10000
1000Base-SX	MMF	LC connector for SFP module	62.5/125	200	.5 – 275
	MMF		62.5/125	500	.5 – 550
	MMF		50/125	900	.5 – 595
	MMF		50/125	1500	.5 – 740
	MMF		50/125	2000	.5 – 860

TABLE 24 Cable length summary (Continued)

	Cable Type	Connector Type	Core Diameter (microns)	Modal Bandwidth (MHz*km) or Wavelength (nm)	Range (meters)
1000Base-T	Copper	RJ-45 jack for standard unshielded twisted pair (UTP or Category 5)	n/a	n/a	up to 100 meters
100Base-BX-U 100Base-BX-D	SMF	LC connector for SFP module	9	1310/1490	10000 (10 km)
100Base-FX	MMF	LC connector for SFP module	62.5	500	up to 2000 (2 km)
100Base-FX-IR	MMF	SC	62.5	125	2 km (1.24 miles)
100Base-FX-LR	SMF	SC	9	125	20 km (12.43 miles)
10GBase-CX4	Infiniband 4x copper	XAUI connector	n/a	n/a	up to 15
10G SFP+	TWNX	SFP	n/a	n/a	up to 15

Power cords

All devices ship with US-compatible power cords unless otherwise specified at the time of order. United Kingdom- and European-compatible power cords are also available.

AC power supply specifications

All devices ship with one removable AC power supply unit with a standard IEC type (IEC320) input connector, operating 100 VAC to 240 VAC input, universal or wide input. Table 25 lists the AC power supply specifications for these devices.

NOTE
For HPOE+ Class 4 power usage, FCX devices with two power supplies can only support up to 27 HPOE ports. For Class 1, 2, or 3 power usage, these devices can support up to 48 ports.

TABLE 25 AC power supply specifications

	Input voltage range	Input current (PSU x 1)	Inrush current	Power draw	Max output power (PSU x1)
Brocade FCX 624S	100 - 240 VAC	1.2 - 2.8 Amps	< 75 Amps peak maximum	94 W	210 W
Brocade FCX 648S	100 - 240 VAC	1.2 - 2.8 Amps	< 75 Amps peak maximum	122 W	210 W
Brocade FCX 624S-HPOE	100 - 240 VAC	3.3 - 7.8 Amps	< 75 Amps peak maximum	107 W 509 W with HPOE 509 W with HPOE+	620 W
Brocade FCX 648S-HPOE	100 - 240 VAC	3.3 - 7.8 Amps	< 75 Amps peak maximum	167 W 970 W with HPOE 970 W with HPOE+	620 W

TABLE 25 AC power supply specifications (Continued)

	Input voltage range	Input current (PSU x 1)	Inrush current	Power draw	Max output power (PSU x1)
Brocade FCX 624S-F	100 - 240 VAC	1.2 - 2.8 Amps	< 75 Amps peak maximum	102.1 W	210 W
Brocade FCX 624-E	100 - 240 VAC	1.2 - 2.8 Amps	< 75 Amps peak maximum	92 W	210 W
Brocade FCX 624-I	100 - 240 VAC	1.2 - 2.8 Amps	< 75 Amps peak maximum	92 W	210 W
Brocade FCX 648-E	100 - 240 VAC	1.2 - 2.8 Amps	< 75 Amps peak maximum	112 W	210 W
Brocade FCX 648-I	100 - 240 VAC	1.2 - 2.8 Amps	< 75 Amps peak maximum	112 W	210 W

Chapter

6 Troubleshooting

Diagnosing switch indicators

TABLE 26 Troubleshooting chart

Symptom	Action
Power LED is Off	• Internal power supply is disconnected. • Check connections between the switch, the power cord, and the wall outlet. • Contact Technical Support.
Power LED is Amber	Internal power supply has failed. Contact Technical Support.
Diag LED is Amber	• The switch self test has detected a fault. • Power cycle the switch to try and clear the condition. If the condition persists, contact Technical Support.
Link LED is Off	• Verify that the switch and attached device are powered on. • Be sure the cable is plugged into both the switch and corresponding device. • Verify that the proper cable type is used and its length does not exceed specified limits. • Check the adapter on the attached device and cable connections for possible defects. Replace the defective adapter or cable if necessary.

Power and cooling problems

If the power indicator does not turn on when the power cord is plugged in, you may have a problem with the power outlet, power cord, or internal power supply. However, if the unit powers off after running for a while, check for loose power connections, power losses or surges at the power outlet, and verify that the fans on the unit are unobstructed and running prior to shutdown. If you still cannot isolate the problem, then the internal power supply may be defective. In this case, contact Technical Support for assistance.

Installation

Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (such as the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly.

In-band access

You can access the management agent in the switch from anywhere within the attached network using Telnet, a Web browser, or other network management software. However, you must first configure the switch with a valid IP address, subnet mask, and default gateway. If you have trouble establishing a link to the management agent, check to see if you have a valid network connection. Then verify that you entered the correct IP address. Also, be sure the port through which you are connecting to the switch has not been disabled. If it has not been disabled, then check the network cabling that runs between your remote location and the switch.

Appendix

Regulatory Statements

A

USA (FCC CFR 47 Part 15 Warning)

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION

Changes or modifications made to this device which are not expressly approved by Brocade could void the user's authority to operate the equipment.

Industry Canada statement

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

English Translation of above statement

This Class A digital apparatus complies with Canadian ICES-003.

Europe and Australia (CISPR 22 Class A Warning)

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Japan (VCCI)

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

English translation of above statement

This is Class A product based on the standard of the Voluntary Control Council For Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Japan power cord

注意 – 添付の電源コードを他の装置や用途に使用しない
添付の電源コードは本装置に接続し、使用することを目的として設計され、その安全性が確認されているものです。決して他の装置や用途に使用しないでください。火災や感電の原因となる恐れがあります。

English translation of above statement

ATTENTION: Never use the power cord packed with your equipment for other products.

Korea

이 기기는 A급 기기로서, 업무용으로 전자파 적합 등록을 한 기기이오니 판재자 또는 사용자는 이 점을 유의하시기 바라며, 만약 잘못 판매 또는 구입하였을 경우에는 가정용으로 교환하시기 바랍니다.

English Translation of Above Statement

This apparatus has radio wave acceptability registration as a Class A device, so sellers or users should be aware of this. If it is sold or purchased incorrectly, it should be exchanged with a home apparatus (Class B).

China

China-CCC Warning statements

在维修的时候一定要断开所有电源 (English translation“disconnect all power sources before service”)

For non tropical use:

安全说明和标记	汉文	“仅适用于非热带气候条件下安全使用。”
	藏文	《ཕྱིས་ཀྱི་ཐ ཚེས་ གཡུང་ གཤུགས་ ཀྱ/ ཉུང་ཟད་ཀྱི་ གཅིག་ ཀུན་ ཉེན་ཚེགས་ ཁག་ལེན་ ཐུབ་ ཨེ/ ཅེས་བཀའ་བསྩལ་ཡོད།》
	蒙古文	“ᠳᠠᠨ᠋ᠳᠠᠢ᠋ᠨ᠋ᠠ᠋ᠭᠤᠯᠠᠭᠤᠷ᠎ᠪᠠᠭᠲᠠᠨ᠎ᠠ᠋ᠷᠭᠠᠳ᠎ᠪᠠᠶᠢᠭᠠᠯᠢ᠎ᠳᠠᠢ᠋ᠨ᠋ᠠ᠋ᠭᠤᠯᠠᠭᠤᠷ᠎ᠲᠠᠢ᠋ ᠬᠣᠯᠪᠣᠭᠳᠠᠵᠤ᠎ᠪᠠᠶᠢᠭᠠᠭᠠᠷᠠᠢ᠎ᠠᠵᠢᠯᠯᠠᠭᠠ᠎ᠬᠢᠬᠡᠳ᠎ᠦᠭᠡᠢ᠎ᠪᠣᠯᠭᠣ

BSMI statement (Taiwan)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，
在這種情況下，使用者會被要求採取某些適當的對策。

English translation of above statement

Warning: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Russia

Сертификат Соответствия в "Системе сертификации в области связи" № ОС-2-СПД-0560, срок действия: с 29 октября 2009 г. до 29 октября 2012 г.

English translation of above statement

Certificate of Conformity in "Certification System in the field of telecommunications" # ОС-2-СПД-0560, validity from the 29 of October 2009 to the 29 of October 2012.

Regulatory compliance

Table 27 lists the Electromagnetic Compatibility (EMC), Immunity standards, and safety agency approvals for the FastIron family of switches.

TABLE 27 Regulatory Compliance and Safety Approvals

Certifications
Emissions: • ICES-003, Electromagnetic Emission • FCC Part 15 Class A • EN 55022/CISPR 22 Class A • VCCI Class A • EN 61000-3-2, Power Line Harmonics • EN 61000-3-3, Voltage Fluctuation & Flicker • EN 61000-6-3, Electromagnetic Compatibility, Generic Standard • AS or NZS CISPR 22, Electromagnetic Compatibility
Immunity: • EN 61000-6-1, Electromagnetic Compatibility, Generic Standard • EN 55024, Information Technology equipment - Immunity Characteristics
Safety: • BI-NAT CSA 60950-1-03/UL 60950-1 • EN 60950-1:2001 • IEC 60950-1:2001

Appendix

Cautions and Danger Notices

B

Cautions

A caution calls your attention to a possible hazard that can damage equipment.

“Vorsicht” weist auf die Gefahr einer möglichen Beschädigung des Gerätes in.

Une mise en garde attire votre attention sur un risque possible d'endommagement de l'équipement. Ci-dessous, vous trouverez les mises en garde utilisées dans ce manuel.

Un mensaje de precaución le advierte sobre un posible peligro que pueda dañar el equipo. Las siguientes son precauciones utilizadas en este manual.

CAUTION	Do not install the device in an environment where the operating ambient temperature might exceed 40° C (104° F).
VORSICHT	Das Gerät darf nicht in einer Umgebung mit einer Umgebungsbetriebstemperatur von über 40° C (104° F) installiert werden.
MISE EN GARDE	N'installez pas le dispositif dans un environnement où la température d'exploitation ambiante risque de dépasser 40° C (104° F).
PRECAUCIÓN	No instale el instrumento en un entorno en el que la temperatura ambiente de operación pueda exceder los 40°C (104°F).

CAUTION	Make sure the air flow around the front, sides, and back of the device is not restricted.
VORSICHT	Stellen Sie sicher, dass an der Vorderseite, den Seiten und an der Rückseite der Luftstrom nicht behindert wird.
MISE EN GARDE	Vérifiez que rien ne restreint la circulation d'air devant, derrière et sur les côtés du dispositif et qu'elle peut se faire librement.
PRECAUCIÓN	Asegúrese de que el flujo de aire en las inmediaciones de las partes anterior, laterales y posterior del instrumento no esté restringido.

CAUTION	Use a separate branch circuit for each AC power cord, which provides redundancy in case one of the circuits fails.
VORSICHT	Es empfiehlt sich die Installation eines separaten Stromkreiszweiges für jede Wechselstrom-Elektroschnur als Redundanz im Fall des Ausfalls eines Stromkreises.
MISE EN GARDE	Utilisez un circuit de dérivation différent pour chaque cordon d’alimentation C.A. Ainsi, il y aura un circuit redondant en cas de panne d’un des circuits.
PRECAUCIÓN	Use un circuito derivado separado para cada cordón de alimentación de CA, con lo que se proporcionará redundancia en caso de que uno de los circuitos falle.

CAUTION	Ensure that the device does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add the ampere (amp) ratings of all devices installed on the same circuit as the device. Compare this total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices near the input power connectors.
VORSICHT	Stromkreise, Verdrahtung und Überlastschutz dürfen nicht durch das Gerät überbelastet werden. Addieren Sie die Nennstromleistung (in Ampere) aller Geräte, die am selben Stromkreis wie das Gerät installiert sind. Somit können Sie feststellen, ob die Gefahr einer Überbelastung der Versorgungsstromkreise vorliegt. Vergleichen Sie diese Summe mit der Nennstromgrenze des Stromkreises. Die Höchstnennströme (in Ampere) stehen normalerweise auf der Geräterückseite neben den Eingangsstromanschlüssen.
MISE EN GARDE	Assurez-vous que le dispositif ne risque pas de surcharger les circuits d'alimentation, le câblage et la protection de surintensité. Pour déterminer le risque de surcharge des circuits d'alimentation, additionnez l'intensité nominale (ampères) de tous les dispositifs installés sur le même circuit que le dispositif en question. Comparez alors ce total avec la limite de charge du circuit. L'intensité nominale maximum en ampères est généralement imprimée sur chaque dispositif près des connecteurs d'entrée d'alimentation.
PRECAUCIÓN	Verifique que el instrumento no sobrecargue los circuitos de corriente, el cableado y la protección para sobrecargas. Para determinar la posibilidad de sobrecarga en los circuitos de suministros, añada las capacidades nominales de corriente (amp) de todos los instrumentos instalados en el mismo circuito que el instrumento. Compare esta suma con el límite nominal para el circuito. Las capacidades nominales de corriente máximas están generalmente impresas en los instrumentos, cerca de los conectores de corriente de entrada.

CAUTION	Use the **erase startup-config** command only for new systems. If you enter this command on a system you have already configured, the command erases the configuration. If you accidentally do erase the configuration on a configured system, enter the write memory command to save the running configuration to the startup-config file.
VORSICHT	Verwenden Sie den Befehl "**Erase startup-config**" (Löschen Startup-Konfig) nur für neue Systeme. Wenn Sie diesen Befehl in ein bereits konfiguriertes System eingeben, löscht der Befehl die Konfiguration. Falls Sie aus Versehen die Konfiguration eines bereits konfigurierten Systems löschen, geben Sie den Befehl "Write Memory" (Speicher schreiben) ein, um die laufende Konfiguration in der Startup-Konfig-Datei zu speichern.
MISE EN GARDE	N'utilisez la commande **erase startup-config** que pour les nouveaux systèmes. Si vous entrez cette commande sur un système que vous avez déjà configuré, elle efface la configuration. Si vous effacez la configuration par accident sur un système configuré, entrez la commande write memory pour enregistrer la configuration actuelle dans le fichier startup-config.
PRECAUCIÓN	Use el comando **erase startup-config** (borrar configuración de inicio) para sistemas nuevos solamente. Si usted introduce este comando en un sistema que ya ha configurado, el comando borrará la configuración. Si usted borra accidentalmente la configuración en un sistema ya configurado, introduzca el comando write memory (escribir memoria) para guardar la configuración en ejecución en el archivo startup-config.

CAUTION	Never leave tools inside the chassis.
VORSICHT	Lassen Sie keine Werkzeuge im Chassis zurück.
MISE EN GARDE	Ne laissez jamais d'outils à l'intérieur du châssis.
PRECAUCIÓN	No deje nunca herramientas en el interior del chasis.

CAUTION	Changes or modifications made to this device that are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
VORSICHT	Falls dieses Gerät verändert oder modifiziert wird, ohne die ausdrückliche Genehmigung der für die Einhaltung der Anforderungen verantwortlichen Partei einzuholen, kann dem Benutzer der weitere Betrieb des Gerätes untersagt werden.
MISE EN GARDE	Les éventuelles modifications apportées à cet équipement sans avoir été expressément approuvées par la partie responsable d'en évaluer la conformité sont susceptibles d'annuler le droit de l'utilisateur à utiliser cet équipement.
PRECAUCIÓN	Si se realizan cambios o modificaciones en este dispositivo sin la autorización expresa de la parte responsable del cumplimiento de las normas, la licencia del usuario para operar este equipo puede quedar anulada.

Danger notices

A danger notification calls your attention to a possible hazard that can cause injury or death. The following are the warnings used in this manual.

"Gefahr" weist auf eine mögliche Gefährdung hin, die zu Verletzungen oder Tod führen können. Sie finden die folgenden Warnhinweise in diesem Handbuch:

Un danger attire votre attention sur un risque possible de blessure ou de décès. Ci-dessous, vous trouverez les avertissements utilisés dans ce manuel.

Una señal de peligro le llama la atención sobre cualquier posible peligro que pueda ocasionar daños personales o la muerte. A continuación se dan las advertencias utilizadas en este manual.

DANGER	The procedures in this manual are for qualified service personnel.
GEFAHR	Die Verfahren in diesem Handbuch sind nur für qualifiziertes Wartungspersonal gedacht.
DANGER	Les procédures décrites dans ce manuel doivent être effectuées par le personnel de service qualifié uniquement.
PELIGRO	Los procedimientos de este manual se han hecho para personal de servicio cualificado.

DANGER	Before beginning the installation, see the precautions in "Power precautions" on page 19.
GEFAHR	Vor der Installation siehe Vorsichtsmaßnahmen unter " Power Precautions " (Vorsichtsmaßnahmen in Bezug auf elektrische Ablagen) auf den Seiten 3-4.
DANGER	Avant de commencer l'installation, consultez les précautions décrites dans " Power Precautions " (Précautions quant à l'alimentation), pages 3-4.
PELIGRO	Antes de comenzar la instalación, consulte las precauciones en la sección " Power Precautions" (Precauciones sobre corriente) que se encuentra en las páginas 3-4.

DANGER	All fiber optic interfaces use Class 1 lasers.
GEFAHR	Alle Glasfaser-Schnittstellen verwenden Laser der Klasse 1.
DANGER	Toutes les interfaces en fibres optiques utilisent des lasers de classe 1.
PELIGRO	Todas las interfaces de fibra óptica utilizan láser de clase 1.

DANGER	Make sure the rack or cabinet housing the device is adequately secured to prevent it from becoming unstable or falling over.
GEFAHR	Stellen Sie sicher, dass das Gestell oder der Schrank für die Unterbringung des Geräts auf angemessene Weise gesichert ist, so dass das Gestell oder der Schrank nicht wackeln oder umfallen kann.
DANGER	Vérifiez que le bâti ou le support abritant le dispositif est bien fixé afin qu'il ne devienne pas instable ou qu'il ne risque pas de tomber.
PELIGRO	Verifique que el bastidor o armario que alberga el instrumento está asegurado correctamente para evitar que pueda hacerse inestable o que caiga.

DANGER	Mount the devices you install in a rack or cabinet as low as possible. Place the heaviest device at the bottom and progressively place lighter devices above.
GEFAHR	Montieren Sie die Geräte im Gestell oder Schrank so tief wie möglich. Platzieren Sie das schwerste Gerät ganz unten, während leichtere Geräte je nach Gewicht (je schwerer desto tiefer) darüber untergebracht werden.
DANGER	Montez les dispositifs que vous installez dans un bâti ou support aussi bas que possible. Placez le dispositif le plus lourd en bas et le plus léger en haut, en plaçant tous les dispositifs progressivement de bas en haut du plus lourd au plus léger.
PELIGRO	Monte los instrumentos que instale en un bastidor o armario lo más bajos posible. Ponga el instrumento más pesado en la parte inferior y los instrumentos progresivamente más livianos más arriba.

DANGER	Disconnect the power cord from all power sources to completely remove power from the device.
GEFAHR	Ziehen Sie das Stromkabel aus allen Stromquellen, um sicherzustellen, dass dem Gerät kein Strom zugeführt wird.
DANGER	Débranchez le cordon d'alimentation de toutes les sources d'alimentation pour couper complètement l'alimentation du dispositif.
PELIGRO	Para desconectar completamente la corriente del instrumento, desconecte el cordón de corriente de todas las fuentes de corriente.

DANGER	If the installation requires a different power cord than the one supplied with the device, make sure you use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the device.
GEFAHR	Falls für die Installation ein anderes Stromkabel erforderlich ist (wenn das mit dem Gerät gelieferte Kabel nicht passt), müssen Sie sicherstellen, dass Sie ein Stromkabel mit dem Siegel einer Sicherheitsbehörde verwenden, die für die Zertifizierung von Stromkabeln in Ihrem Land zuständig ist. Das Siegel ist Ihre Garantie, dass das Stromkabel sicher mit Ihrem Gerät verwendet werden kann.
DANGER	Si l'installation nécessite un cordon d'alimentation autre que celui fourni avec le dispositif, assurez-vous d'utiliser un cordon d'alimentation portant la marque de l'organisation responsable de la sécurité qui définit les normes et régulations pour les cordons d'alimentation dans votre pays. Cette marque vous assure que vous pouvez utiliser le cordon d'alimentation avec le dispositif en toute sécurité.
PELIGRO	Si la instalación requiere un cordón de corriente distinto al que se ha suministrado con el instrumento, verifique que usa un cordón de corriente que venga con la marca de la agencia de seguridad que defina las regulaciones para cordones de corriente en su país. Esta marca será su garantía de que el cordón de corriente puede ser utilizado con seguridad con el instrumento.

DANGER	For safety reasons, the ESD wrist strap should contain a series 1 meg ohm resistor.
GEFAHR	Aus Sicherheitsgründen sollte ein EGB-Armband zum Schutz von elektronischen gefährdeten Bauelementen mit einem 1 Megaohm-Reihenwiderstand ausgestattet sein.
DANGER	Pour des raisons de sécurité, la dragonne ESD doit contenir une résistance de série 1 méga ohm.
PELIGRO	Por razones de seguridad, la correa de muñeca ESD deberá contener un resistor en serie de 1 mega ohmio.

B Danger notices